A Look at

Grades Seven and Eight in California Public Schools

Transitioning to the
Common Core State Standards in English Language Arts and Mathematics

Curriculum Frameworks and Instructional Resources Division
Instruction and Learning Support Branch
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Notice
The guidance in *A Look at Grades Seven and Eight in California Public Schools: Transitioning to the Common Core State Standards in English Language Arts and Mathematics* is not binding on local educational agencies or other entities. Except for the statutes, regulations, and court decisions that are referenced herein, the document is exemplary, and compliance with it is not mandatory. (See *Education Code* Section 33308.5.)

Contents

A Message from the State Superintendent of Public Instruction

In 1997, California adopted its first set of content standards in English language arts and mathematics. These educational standards provided clear goals for student learning and helped teachers determine the knowledge and skills students needed to be successful in classrooms and careers. In 2010, the California State Board of Education adopted standards in both mathematics and English language arts: the Common Core State Standards (CCSS), with California additions. The CCSS maintain the rigor of the 1997 standards and help ensure that students consistently receive a high-quality education, from school to school and from state to state.

A Look at Grades Seven and Eight in California Public Schools: Transitioning to the Common Core State Standards in English Language Arts and Mathematics is a valuable resource for teachers, administrators, and parents during our first steps to incorporate the CCSS in grade-level curriculum. This online document continues the guidance on implementing the CCSS provided for earlier grades in the publication *A Look at Kindergarten Through Grade Six in California Public Schools: Transitioning to the Common Core State Standards in English Language Arts and Mathematics*.

As the CCSS are put into practice over the next few years, new curriculum frameworks, professional development opportunities, and standards-based instructional materials and assessments will continue to be developed. This document provides an initial step in implementation as we begin the integration of the new standards.

A Look at Grades Seven and Eight in California Public Schools: Transitioning to the Common Core State Standards in English Language Arts and Mathematics serves as another tool for improving the academic achievement of California's students. It represents the California Department of Education's ongoing commitment to provide resources and guidance to parents and educators dedicated to making a difference in the future of our students

Tom Torlakson
State Superintendent of Public Instruction

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Special thanks also go to the CDE staff members who created *A Look at Kindergarten Through Grade Six in California Public Schools: Transitioning to the Common Core State Standards in English Language Arts and Mathematics*. They created the model for this new edition that focuses on grades seven and eight.

Introduction

This course-level guide provides teachers, parents, administrators, and others with an overview of what seventh- and eighth-grade students are expected to learn in English language arts and mathematics in California's public schools. It was also developed to assist educators with the transition from the content standards adopted in 1997 for English language arts and mathematics to the Common Core State Standards (CCSS), with California additions, adopted in August 2010 for English language arts and mathematics.

The California *Education Code* (*EC*) mandates the adopted course of study for grades one through twelve. *EC* Section 51220, in describing the courses of study for students in grades seven through twelve, states that the study of English include knowledge of and appreciation for literature, language, and composition and the skills of reading, listening, and speaking. It also requires mathematics instruction designed to develop mathematical understandings, operational skills, and insight into problem-solving procedures.

In grades seven through twelve, every school in California is required to offer, in addition to English and mathematics, courses in social sciences, foreign language or languages, physical education, science, visual and performing arts, applied arts, career technical education, automobile driver education, and other studies that may be prescribed. However, physical education is the only subject in which the amount of instructional time is established: a total period of time not less than 400 minutes each 10 school days. The schedule of the instructional day and week is determined by the teacher and the local school and district administration.

The 1997 California Standards and the Common Core State Standards

California's standards have been hailed for their rigor, setting high expectations for all students. In 1997, California adopted content standards in English language arts and mathematics. Since that time, standards have been adopted in history–social science, science, visual and performing arts, health, world languages, physical education, school library, and career technical education. California also has standards in English-language development (ELD), which define the stages of becoming proficient in English. All content standards are posted in PDF and Word format on the CDE Content Standards Web page at http://www.cde.ca.gov/be/st/ss/ (accessed February 23, 2012).

As part of a multistate initiative to establish clear and consistent education standards, the California State Board of Education voted unanimously on August 2, 2010, to adopt new standards for both mathematics and English language arts: the CCSS. These are based on research, internationally benchmarked, and designed to prepare every student for success in college and the workplace.

Implementation of the new standards is just beginning. It will take several years to implement the CCSS…

Implementation of the new standards is just beginning. It will take several years to implement the CCSS, as the process will include adopting aligned instructional materials, creating professional learning opportunities, and administering new statewide assessments. For more information about the implementation of the CCSS and for links to download the new standards, please visit the CDE Common Core State Standards Resources Web page at http://www.cde.ca.gov/ci/cc/ (accessed February 23, 2012). During this transition period, educators, parents,

and students will have an opportunity to become familiar with the many similarities between California's 1997 content standards and the CCSS and to learn about the enhancements for each grade level.

California's content standards provide detailed expectations of what students should know and be able to do at each grade level. Although the standards are intended to provide objectives for students and teachers, decisions about classroom instruction are generally made at the local level by the teacher, local administrator, and/or the locally elected school board.

Curriculum and instruction are influenced by more than content knowledge, standards, and specific subject objectives. The following sections include some of the other areas and issues that influence and connect a grade-level course of study, including universal access, statewide testing and accountability, federal accountability, and funding. In addition, brief overviews of classroom assessment, instructional materials, and teacher standards are provided.

Universal Access

The ultimate goal of the education system in California is to ensure that all students have access to high-quality curriculum and instruction so that they may meet or exceed the knowledge and skills defined in the state's academic content standards. There have been dramatic shifts in the student population in recent years. Ethnically and racially diverse students made up 53 percent of the student population in 1990 (California Department of Education 1991). By the 2008–09 school year, this group represented 72 percent, making California's student population the most diverse in the nation (California Department of Education 2010a). Approximately 25 percent of California's students are English learners and over 50 percent of students qualify for free and reduced-price lunch programs (California Department of Education 2010a).

Teachers must create learning environments in which differences are respected and supported by teacher and students alike.

The diversity of California's students presents unique opportunities and significant challenges for instruction. Students come to school with a wide variety of skills, abilities, and interests as well as different levels of proficiency in English and other languages. Additionally, as students begin to develop an understanding of their role in their own families and communities, the differences in cultural norms, traditions, and values between themselves and others are likely to become more evident. The wider the variation of the student population in each classroom, the more complex the teacher's role becomes in organizing high-quality curriculum and instruction. Teachers must create learning environments in which differences are respected and supported by teacher and student alike. Teachers who are aware of their own cultural values and are willing to learn about and appreciate other people's cultural values can establish safe learning environments for students.

The academic success of students with special needs depends on the teacher's skill in providing instruction and support to all students. A student's 504 Plan or individualized education program (IEP) often includes suggested techniques to ensure that the student has full access to a program designed to provide appropriate learning opportunities, instructional materials, and strategies that best meet his or her needs. When systematically planned differentiation strategies are used, students with special needs can benefit from appropriately challenging curriculum and instruction. Strategies for differentiating instruction for students include adjusting pacing, complexity, novelty, and depth. Despite modifications made, however, the focus is always to help students learn grade-level content to the best of their ability.

Response to Intervention (RtI) has emerged on the national scene as an effective strategy for serving individual students and identifying students with learning disabilities. California has expanded the notion of RtI to RtI², which stands for Response to Instruction and Intervention. RtI² integrates resources from general education, categorical programs, and special education through a comprehensive system of core instruction and interventions to benefit every student. For more information about RtI², please visit the CDE Response to Instruction & Intervention Web page at http://www.cde.ca.gov/ci/cr/ri/ (accessed February 24, 2012).

For English learners to benefit from universal access to the curriculum, teachers may need additional support to plan instruction, differentiate curriculum, infuse instruction with specially designed academic instruction in English

(SDAIE), and use grouping strategies effectively. Instruction in content areas should be promoted despite low literacy or limited proficiency in the English language, along with the critical-thinking and analytical skills and the particular reading strategies of the disciplines. The CDE has published an excellent resource, *Improving Education for English Learners: Research-Based Approaches* (2010b), that provides the most comprehensive, up-to-date strategies to serve English learners. The book includes guidelines for using ELD and SDAIE strategies, as well as recommended instructional practices. The publication is available through the CDE Press Web page at http://www.cde.ca.gov/re/pn/rc/ (accessed February 24, 2012).

Teachers may also implement other strategies to meet the needs of students with reading difficulties, students with disabilities, advanced learners, English learners, students with culturally diverse backgrounds, and students with combinations of special instructional needs. The following strategies can be useful in planning for universal access:

- utilize frequent progress-monitoring assessments;
- engage in careful planning and organization;
- differentiate to meet students' instructional needs;
- employ flexible grouping strategies;
- enlist help from others;
- use technology or other instructional devices.

California's Achievement Gap

The achievement gap is a persistent disparity in performance on statewide assessments, with white and Asian American students generally outperforming African American and Latino students. The CDE has identified a gap in performance on the California Standards Tests (CSTs) in English language arts and mathematics that has persisted despite improvements across all grade levels in recent years. Although the number of students demonstrating proficiency on these statewide assessments has grown, the gap between white or Asian American students and African Americans and Latinos remains significant, despite a narrowing in 2009–10 (California Department of Education 2010c).

This achievement gap is often explained in terms of the socioeconomic status of students, but a deeper study of assessment data indicates that this is not the sole determinant behind student outcomes.

This achievement gap is often explained in terms of the socioeconomic status of students, but a deeper study of assessment data indicates that this is not the sole determinant behind student outcomes. In fact, when socioeconomic status is controlled for, the achievement gap remains starkly evident. For example, on the 2010 Algebra 1 CST, 23 percent of African American students and 27 percent of Latino students who were not classified as "socioeconomically disadvantaged" scored at the level of "proficient" or higher. By comparison, 27 percent of white students who were classified as socioeconomically disadvantaged scored at "proficient" or higher on the same assessment (47 percent of white, not socioeconomically disadvantaged students scored "proficient" or higher on the 2010 Algebra 1 CST). On most of the English language arts and mathematics CSTs, nondisadvantaged African American and Latino students performed only slightly better than disadvantaged whites, although in some cases they performed at a lower level. These numbers show that middle-class minority students are having difficulty outperforming white students who come from disadvantaged backgrounds. Clearly, this fact indicates that there are deeper causal factors at work that transcend economic status (California Department of Education 2011a).

To address the achievement gap and provide a vision of what California's education system could become, State Superintendent Tom Torlakson brought together leaders from across the state—teachers, parents, community, labor, and business leaders—to share their thinking about education in the state. The resulting report, *A Blueprint for Great Schools* (California Department of Education 2011b) identifies a direction for education with a focus on twenty-first century learning, meeting the needs of the whole child, and rebuilding the ranks of California's teachers with resources and respect. A new system of education in California encompasses

the following areas: Educator Quality; Curriculum and Assessment; Higher Education and Secondary Alignment; Accountability and School Improvement; Early Childhood Education; Educator Supports; Health, Nutrition, and Physical Fitness; School Finance; and Facilities and Construction Reform. The report, which includes a wide range of recommendations to foster excellence in teaching, provide community support for families, and retool schools to make students competitive in college and the workforce may be viewed at http://www.cde.ca.gov/eo/in/bp/ (accessed February 23, 2012).

Statewide Testing and Accountability

Students in grades two through eleven participate in the state's Standardized Testing and Reporting (STAR) program, which consists of assessments in multiple subjects. The assessment results are used in statewide and federal accountability systems and are used to gauge the effectiveness of each school's instructional program in developing student proficiency in the knowledge and skills described in the content standards. Districts with consistently low achievement in these areas may face state intervention designed to help them improve students' academic performance.

The adoption of the CCSS will lead to the development of new assessments and performance-level descriptors that explain what students know and can do in English language arts and mathematics.[1] On June 9, 2011, California joined the SMARTER Balanced Assessment Consortium (SBAC) as a governing state. The SBAC is a national consortium of 28 states that have been working collaboratively to develop a student assessment system aligned with the CCSS. Of those 28, California is among 21 governing states that allow decision-making participation. The remaining seven are advisory states. The SBAC focus is on annual assessment of students in grades three through eight in English language arts and mathematics and in grade eleven. The SBAC has received federal grants to fund the development of the new assessments, which are anticipated to be fully implemented by the 2014–15 school year, with pilot testing in 2012–13 and field testing in 2013–14. To obtain the most current information regarding California's participation in the SBAC, visit the CDE SMARTER Balanced Assessment Consortium Web page at http://www.cde.ca.gov/ta/tg/sa/smarterbalanced.asp (accessed February 23, 2012).

The California English Language Development Test (CELDT) is administered to students who are English learners. The CELDT has three purposes: (1) to identify students who have limited English proficiency; (2) to determine the level of proficiency of students who have limited English skills and knowledge; and (3) to assess the progress of English learners in acquiring the skills of listening, reading, speaking, and writing in English. The CELDT performance levels are *beginning, early intermediate, intermediate, early advanced,* and *advanced.*

Federal Accountability and Funding

Federal law requires all states to implement a statewide federal accountability system based on challenging state standards in reading/language arts and mathematics. Annual testing of students is required as well as the identification of annual academic performance goals (as measured by student achievement on statewide, standards-aligned assessments). Assessment results are broken down according to students' race, ethnicity, disability, and proficiency in English to ensure that no group is left behind without an education. *Adequate*

1. The performance-level descriptors for the California Standards Test are available at http://starsamplequestions.org/starRTQ/search.jsp [Outside Source] (Accessed February 23, 2012). Currently, there are no performance-level descriptors for the CCSS.

yearly progress (AYP) is the term used to describe the annual academic performance goals established for all schools, local educational agencies (LEAs), and the state as a whole. AYP is required under Title I of the federal Elementary and Secondary Education Act. Additional information is available through the CDE's Adequate Yearly Progress Web page at http://www.cde.ca.gov/ta/ac/ay/ (accessed February 24, 2012).

Part of the AYP calculation is based on the results of the assessments in the STAR program for students in grades two through eight and the California High School Exit Examination (CAHSEE) for students in grade ten. Assessments of students' progress in English language arts and mathematics are included in the AYP report. For additional information, please review the table "Assessment Results used in 2011 AYP Calculations," which is included in the *2011 Adequate Yearly Progress Report: Information Guide* posted at http://www.cde.ca.gov/TA/ac/ay/documents/aypinfoguide11.pdf (accessed February 24, 2012).

Title I and Title III are major sources of federal funding for K–12 education in California. Most LEAs in California receive funding from those programs. Both programs provide support for improving students' academic achievement, though the students served and the requirements of the programs differ.

Title I

Title I, Part A, federal funds help LEAs meet the educational needs of low-achieving students in California's highest-poverty schools. Funds are used to support effective, research-based educational strategies to close the achievement gap between high- and low-performing students and enable the students to make the state's challenging academic standards. LEAs and schools that fail to meet AYP goals are subject to improvement and corrective-action measures. In California, Program Improvement (PI) is the formal designation for Title I–funded schools and LEAs that fail to make AYP for two consecutive years. Additional information is available on the CDE Title I, Part A, Web page at http://www.cde.ca.gov/sp/sw/t1/titleparta.asp (accessed February 24, 2012).

Title III

Title III, Part A, is officially known as the English Language Acquisition, Language Enhancement, and Academic Achievement Act. The overarching purpose of Title III is to ensure that limited-English-proficient students (called English learners under California law) attain proficiency in English and meet the same challenging academic content and achievement standards that other students are expected to meet. LEAs must use Title III funds to implement language instruction programs designed to help English learners meet those standards. Title III requires that states hold LEAs accountable for meeting three annual, measurable achievement objectives for English learners: (1) making annual progress on the CELDT, (2) attaining English proficiency on the CELDT, and (3) making adequately yearly progress at the LEA level. Additional information is available on the CDE English Learners Web page at http://www.cde.ca.gov/sp/el/ (accessed February 24, 2012).

Classroom Assessment

Customized, rigorous, and thoughtful assessment can guide instruction, improve student learning, and develop thinking skills in a particular discipline. The key to using assessments effectively and efficiently in a program of instruction is to recognize that different types of assessment tools are used for different purposes. The following assessments are crucial for measuring student mastery of the knowledge and skills outlined in the subject-area content standards:

- **Entry-level assessment:** Do students possess the necessary prerequisite skills and knowledge expected at their grade level? Do they already know some of the material to be taught? Because entry-level assessments determine the level of student readiness for a given unit or course, they should be developed after the summative assessment is designed.

- **Monitoring of progress** (also known as **formative assessment**)**:** Are students progressing adequately toward mastery of the standards? Do they need reteaching? Is emphasis on certain instructional components or skills needed in the next series of lessons or units? Assessments for monitoring progress should be designed after the entry-level assessment—and therefore after the summative assessment—and include both formal and informal classroom measures.

- **Summative assessment:** Have students achieved the goals defined by a given standard or group of standards? This type of assessment includes the content and skills that students are expected to have learned and that are also covered in the various entry-level and monitoring assessments. Summative assessments are often used for grading students.

Although many other purposes exist for assessment, the three named above are critical because they inform instruction. Taken together, they provide a road map to mastering the standards: the starting place, the routes to take, the points at which routes should be changed, and the destination.

Instructional Materials

Basic instructional materials are selected by the local governing board from a list of materials adopted by the California State Board of Education (SBE). The SBE adopts instructional materials in reading/language arts, mathematics, science, history–social science, health, world languages, and visual and performing arts. Local school districts must provide for "substantial teacher involvement" in the selection of materials and promote the involvement of parents and other members of the community in the selection process (*EC* Section 60002). Districts are required to provide every student with standards-aligned instructional materials in the four core academic subject areas. The materials are to be used in class and made available to take home (*EC* Section 60119). More information about instructional materials, including a link to the price list of currently adopted materials, is posted at the CDE Curriculum Frameworks and Instructional Materials Web page at http://www.cde.ca.gov/ci/cr/cf/ (accessed February 23, 2012).

Electronic materials are also included on the adoption lists as options that districts may select. Several programs are entirely digital. The California Learning Resource Network (http://www.CLRN.org [Outside Source] (accessed February 23, 2012) conducts ongoing reviews of supplemental, technology-based materials for alignment with state content standards. Governing boards of school districts may select supplemental instructional materials for use in district schools. More information about supplemental instructional materials is posted on the CDE Social Content Review Web page at http://www.cde.ca.gov/ci/cr/cf/lc.asp (accessed February 23, 2012).

In July 2009 and March 2011, as a result of the state budget crisis, the California Legislature and Governor suspended the adoption of instructional materials until the 2014–15 school year. Districts may continue to purchase and use materials from past adoption lists until new materials are adopted by the SBE. New adoptions in reading/language arts and mathematics based on the CCSS will take place, but a timeline for those adoptions has not yet been finalized. More information about the implementation of the CCSS is posted on the CDE Common Core State Standards Resources Web page at http://www.cde.ca.gov/ci/cc/ (accessed February 23, 2012).

Recent legislation addressed the need for providing instructional materials aligned with the CCSS prior to 2015. Under Senate Bill 140 (Lowenthal), supplemental instructional materials that bridge the gap between the content of materials currently used in schools and the CCSS will be developed. These "bridge materials" will work with either SBE-adopted materials or other materials being used in districts. The intent is for the supplemental materials to include the minimum amount of content needed to fully address the CCSS and keep costs as low as possible for districts. The most up-to-date information and timeline about the supplemental instructional materials review is posted on the Curriculum Frameworks and Instructional Materials Web page at http://www.cde.ca.gov/ci/cr/cf/suptsupmatreview.asp (accessed February 24, 2012).

The suspension of instructional materials also included the suspension of curriculum frameworks in all content areas. Passed in October 2011, Assembly Bill 250 (Brownley) begins the process for the development and adoption of curriculum frameworks aligned with the CCSS in English language arts and mathematics. Currently, the mathematics framework is planned for adoption in May 2013 and the framework for English language arts is planned for May 2014. Other legislation established the English Language Development Standards Advisory Committee. This committee was assigned the task of updating, revising, and aligning the English-language development (ELD) standards with the CCSS. These revised ELD standards will be included as part of the 2014 English language arts framework. More information about curriculum frameworks is posted on the CDE Curriculum Frameworks and Instructional Materials Web page at http://www.cde.ca.gov/ci/cr/cf/ (accessed February 23, 2012).

California Standards for the Teaching Profession

One of the most important factors in student achievement is the teacher. The U.S. Department of Education's Teacher-to-Teacher Initiative describes the importance of the teacher's role in this way:

> Research confirms that teachers are the single most important factor in raising student achievement. Highly qualified teachers can maximize every child's potential to meet high academic standards. Good teachers are essential to closing the achievement gap and ensuring that no child is left behind. (U.S. Department of Education 2007)

The California Standards for the Teaching Profession (CSTP), available on the California Commission on Teacher Credentialing Web site at http://www.ctc.ca.gov/educator-prep/standards/CSTP-2009.pdf [Outside Source] (accessed February 23, 2012), provide a common language and vision of the scope and complexity of teaching to enable teachers to define and develop their practice. The CSTP were revised in 2009 based on current research and expert advice pertaining to best teaching practices and are an integral part of the efforts to foster excellence in teaching and learning.

The standards are organized around the following domains of teaching practice:

- Engaging and supporting all students in learning
- Creating and maintaining effective environments for student learning
- Understanding and organizing subject matter for student learning
- Planning instruction and designing learning experiences for all students
- Assessing students for learning
- Developing as a professional educator

Although all of the categories affect teaching and learning, the "Understanding and organizing subject matter for student learning" standard directly affects curriculum. This category consists of the following key elements:

- demonstrating knowledge of subject-matter content, academic content standards, and curriculum frameworks
- applying knowledge of student development and proficiencies to ensure student understanding of subject matter
- organizing curriculum to facilitate student understanding of the subject matter
- utilizing instructional strategies that are appropriate to the subject matter
- using and adapting resources, technologies, and standards-aligned instructional materials, including adopted materials, to make subject matter accessible to all students
- addressing the needs of English learners and students with disabilities to provide equitable access to content

Other Resources

The following list contains Web resources from the CDE, the U.S. government, and other government agencies that may be useful to teachers, administrators, and parents. The CDE Web pages typically include a contact person, telephone number, and e-mail address that can be used to seek clarification and answer questions on any of these topics.

Courses of Study

- **Middle Grades Courses of Study** (http://www.cde.ca.gov/ci/gs/mg/documents/mgcorstdyinstrctm.doc) (accessed February 23, 2012).
  This Web page includes information based on requirements in the California *Education Code* and recommendations from the CDE and national subject-area associations.
- **State Minimum Course Requirements** (http://www.cde.ca.gov/ci/gs/hs/hsgrmin.asp) (accessed February 23, 2012).
  This Web page lists state-level course requirements for high school graduation in California.
- **Taking Center Stage** (http://www.cde.ca.gov/ci/gs/mg/tcs.asp) (accessed February 23, 2012).
  This Web page provides clear recommendations on how middle schools can align standards, assessment, accountability, and curriculum to ensure that all students meet grade-level content standards. The CDE also developed **Taking Center Stage, Act II** (http://pubs.cde.ca.gov/tcsii/) [Outside Source] (accessed February 23, 2012), a Web portal of resources for middle grades educators.

California's Content Standards

- **Common Core State Standards** (http://www.cde.ca.gov/ci/cc/) (accessed February 23, 2012).
  This Web page contains information, download links, and frequently asked questions (FAQs) related to the new Common Core State Standards in English language arts and mathematics.

- **Content Standards** (http://www.cde.ca.gov/be/st/ss/index.asp) (accessed February 23, 2012).
  This Web page includes the complete standards documents in Microsoft Word (DOC) and Adobe Portable Document Format (PDF) versions for download.

Universal Access

- **Clearinghouse for Specialized Media and Translations (CSMT**) (http://www.cde.ca.gov/re/pn/sm/) (accessed February 23, 2012).
  This unit (a part of the CDE's Curriculum Frameworks and Instructional Resources Division) provides materials and information for students who need access to the core curriculum in various formats (e.g., braille, large print).

- **English Learners** (http://www.cde.ca.gov/sp/el/) (accessed February 23, 2012).
  This Web page provides a set of links to programs and information that aim to improve the language proficiency of English learners and help them meet content standards adopted by the State Board of Education.

- **Gifted and Talented Education (GATE)** (http://www.cde.ca.gov/sp/gt/gt/) (accessed February 23, 2012).
  This Web page provides information about the purpose of the GATE program, requests for applications and application renewal dates, principal apportionment calculations, and Advanced Placement and International Baccalaureate programs.

- **Special Education** (http://www.cde.ca.gov/sp/se/) (accessed February 23, 2012).
  This Web page offers information and resources to serve the unique needs of children with disabilities so that each child will meet or exceed high standards of achievement in academic and nonacademic skills.

California's Achievement Gap

- **A Blueprint for Great Schools** (http://www.cde.ca.gov/eo/in/bp/) (accessed February 12, 2012).
  This Web page offers a link to Superintendent Torlakson's report, *A Blueprint for Great Schools*, which provides vision and direction for California's education system, including a focus on twenty-first century learning, meeting the needs of the whole child, and rebuilding the ranks of California's teachers with resources and respect.

- **Brokers of Expertise** (http://www.myboe.org/) [Outside Source] (accessed February 24, 2012).
  Brokers of Expertise is a social network that allows educators to search for and follow colleagues who have had success in teaching specific California content standards or who work with similar types of students. Users share instructional practices through links, video, pictures, or documents, allowing other teachers to replicate similar innovations in their classrooms. The Web site also lists where each resource came from and provides a blog where educators may share their thoughts and feedback.

- **The CDE on iTunes U** (http://www.cde.ca.gov/re/mm/it/) (accessed February 24, 2012).
  A partnership between the CDE and Apple, Inc., the CDE on iTunesU is a free site that offers a centralized, shared repository of quality professional development content produced by local educational agencies (districts and schools), other educational entities, and the CDE. The site includes a variety of content assets and formats (videos, Webinars, podcasts, presentations, and PDFs).

- **Closing the Achievement Gap** (http://www.closingtheachievementgap.org/cs/ctag/print/htdocs/home.htm) [Outside Source] (accessed February 12, 2012).
  This Web page serves as an electronic hub for helpful information, research, and success stories about efforts to close the achievement gap in California.

English Language Arts

- **CDE Reading/Language Arts** (http://www.cde.ca.gov/ci/rl/) (accessed February 24, 2012).
  This Web page is an index to current curriculum frameworks and content standards, instructional materials and resources, and a collection of recommended literature for students in kindergarten through grade twelve.

- **CDE Reading/Language Arts Professional Development** (http://www.cde.ca.gov/pd/ca/rl/) (accessed February 12, 2012).
  This Web page offers resources for professional development to improve classroom instruction in reading and language arts. It includes links to the *Parent Handbook for English–Language Arts*, the Reading First federal program, and outside resources for the teaching of reading.

- **California Reading and Literature Project** (http://csmp.ucop.edu/projects/view/crlp/) [Outside Source] (accessed February 24, 2012).
  This project provides professional development programs, resources, and research in language and literacy instruction, including a focus on academic English-language development, and links universities with schools and districts in collaborative partnerships.

- **California Writing Project** (http://csmp.ucop.edu/projects/view/cwp/) [Outside Source] (accessed February 24, 2012).
  The California Writing Project provides professional development programs, resources, and research to improve student writing and learning by improving the teaching of writing.

- **SCORE Language Arts** (http://www.sdcoe.k12.ca.us/SCORE/welcome.html) [Outside Source] (accessed February 24, 2012).
  This Web page is a connection to cyber (literature) guides, activity banks, and phonics links for language arts.

- **U.S. Department of Education—Lessons in Reading/Language Arts** (http://www.free.ed.gov/subjects.cfm?subject_id=78) [Outside Source] (accessed February 24, 2012).
  This Web page provides a source of lessons and units for teaching reading and language arts.

Mathematics

- **CDE CalServe K–12 Service-Learning Initiative** (http://www.cde.ca.gov/ci/cr/sl) (accessed February 24, 2012).
  This Web page provides information about the CalServe K–12 Service-Learning Initiative, including the California STEM Service-Learning Initiative. The initiative supports secondary school and higher-education students working together to meet community needs through a STEM (science, technology, engineering, and mathematics) design process.

- **CDE Mathematics** (http://www.cde.ca.gov/pd/ca/ma/index.asp) (accessed February 24, 2012).
  This site provides resources related to mathematics curriculum and instruction for administrators, educations, parents and students. It includes links to various mathematics professional development programs and resources, a parent handbook, graduation requirements, foundational documents that guide California's mathematics instruction, and contacts within the CDE.

- **California Mathematics Project** (http://csmp.ucop.edu/projects/view/cmp/) [Outside Source] (accessed February 24, 2012).
  The California Mathematics Project provides support for ongoing professional development that enhances teachers' mathematical content knowledge and pedagogical content knowledge aligned with the California mathematics standards and framework.

Statewide Accountability

- **DataQuest** (http://dq.cde.ca.gov/dataquest/) (accessed February 24, 2012).
  DataQuest is a resource for state, county, district, and school-level reports. It provides information on a variety of topics, including test scores, enrollment figures, and school staffing.

- **SMARTER Balanced Assessment Consortium (SBAC)**
  (http://www.cde.ca.gov/ta/tg/sa/smarterbalanced.asp) [Outside Source] (accessed February 24, 2012).
  This Web page provides the most current information about the next generation of assessments. The SBAC is a national consortium of 28 states that have been working collaboratively to develop a student assessment system aligned to a common core of academic content standards. Of those, California is one of 21 governing states, which allows decision-making participation. The remaining seven are advisory states. The SBAC focus is on assessing students annually in grades three through eight in English language arts and mathematics and once in grades ten through twelve under current federal requirements.

- **STAR Test Information for Parents** (http://www.starsamplequestions.org/) [Outside Source] (accessed February 24, 2012).
  At this Web site parents can learn more about the California Standardized Testing and Reporting (STAR) program and view sample questions released from previously administered STAR tests.

- **Testing and Accountability Web Page** (http://www.cde.ca.gov/ta/) (accessed February 24, 2012).
  This Web page provides links to information about various elements of the statewide accountability system, including the CAHSEE, the STAR program, and statewide interventions.

Federal Accountability

- **Elementary and Secondary Education Act** (http://www.cde.ca.gov/nclb/) (accessed February 24, 2012).
  This Web page provides links to state and federal resources about the requirements of the Elementary and Secondary Education Act.

- **Title I, Part A** (http://www.cde.ca.gov/sp/sw/t1/titleparta.asp) (accessed February 24, 2012).
  This Web page provides information about federal requirements and the allowable uses of the funds.

- **Title III** (http://www.cde.ca.gov/sp/el/t3/) (accessed February 24, 2012).
  This Web page provides information about language instruction for limited-English-proficient and immigrant students.

Instructional Materials

- **California Learning Resource Network** (http://www.clrn.org/home/) [Outside Source] (accessed February 23, 2012).
  The California Learning Resource Network (CLRN) Web site provides information on and Web links to electronic, standards-aligned learning resources (e.g., software, videos, DVDs, CD-ROMs) and assessment tools.

- **Instructional Materials Ordering and Distribution System (IMODS)** (http://csmt.cde.ca.gov/index.aspx) (accessed February 24, 2012).
  Free instructional materials are provided for students with disabilities through the CDE Clearinghouse for Specialized Media and Translations in various formats such as braille, large-print, audio, digital talking books, and electronic files.

- **Instructional Materials Price List** (http://www3.cde.ca.gov/impricelist/implsearch.aspx) (accessed February 24, 2012).
  This CDE Web page has a searchable list of all state-adopted instructional materials for kindergarten through grade eight. The list is updated with each new adoption of instructional materials, and publishers have the right to submit price increases for existing lists every two years.

- **Social Content Review** (http://www.cde.ca.gov/ci/cr/cf/lc.asp) (accessed February 24, 2012).
  This Web page includes a searchable CDE database of supplemental instructional materials that have passed a social content review. Although these materials are not considered state-approved or state-adopted, they have met all of the requirements in the *Education Code* for social content.

California Standards for the Teaching Profession

- **California Commission on Teacher Credentialing** (http://www.ctc.ca.gov/) [Outside Source] (accessed February 24, 2012).
  This Web site provides information about credentialing requirements for California teachers. The 2009 California Standards for the Teaching Profession (CSTP) are posted at http://www.ctc.ca.gov/educator-prep/standards/CSTP-2009.pdf [Outside Source] (accessed February 24, 2012).

Seventh-Grade Curriculum

What will my child learn in English language arts and mathematics in seventh grade?

In August 2010, the state adopted the Common Core State Standards for English language arts and mathematics. How will the new standards enhance seventh-grade curriculum?

This chapter contains two sections—English language arts and mathematics—that describe what students should know and be able to do by the end of seventh grade. Each section includes a brief description of the seventh-grade standards, concluding with a list of the seventh-grade standards for the Common Core State Standards (CCSS), with California additions, for English language arts and mathematics.

English Language Arts

Overview

In seventh grade, the English language arts standards establish a higher level of communication skills and comprehension strategies. Students demonstrate a growing understanding by connecting ideas and information in two or more texts and analyzing and evaluating textual evidence more carefully. Their writing reflects both a deeper understanding of texts and the interrelationship between reading and writing as they draw evidence to support their claims and convey concepts and ideas. Seventh-grade students build on their communication and collaboration skills from earlier grades. As they engage in collaborative discussions, they are able to acknowledge and analyze new information and, when appropriate, modify their own view based on the new information. Students continue to acquire and use general academic language and domain-specific vocabulary. They also learn to use precise and concise language to express themselves in their speaking and writing.

Seventh-grade students build on their communication and collaboration skills from earlier grades.

There are many similarities between the CCSS and the 1997 California English language arts standards, but there are also some notable differences. For instance, in the CCSS, the standards in seventh grade are divided into strands: Reading, Writing, Speaking and Listening, and Language. In the 1997 California English language arts standards, the standards are organized around domains: Reading, Writing, Written and Oral English Language Conventions, and Listening and Speaking. An organizational change in the CCSS for grades six through twelve is the inclusion of another set of standards: Reading and Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects. These standards are not intended to replace existing standards in those content areas; instead, they supplement instruction and provide consistency in expectations across the curriculum.

This section provides an overview of the new CCSS for seventh-grade English language arts. It includes guidance to ensure success for struggling readers and English learners. A complete list of the seventh-grade CCSS for English language arts, with California additions, can be found at the end of this section. A complete list of the 1997 California English language arts standards for seventh grade is located on the CDE Content Standards Web page at http://www.cde.ca.gov/be/st/ss/documents/elacontentstnds.pdf (accessed February 29, 2012).

What Students Learn in Seventh Grade

Reading

Three important emphases of the CCSS in reading are text complexity, a balance between literature and informational text, and an integrated approach to instruction. The term *text complexity band* is the focus of Standard 10 in the reading standards for literature, for informational text, and in the reading standards for literacy in history/social studies, science, and technical subjects. Standard 10 sets the expectation that students will read increasingly complex

text each year from second grade through high school.[1] The text complexity band for grades six through eight sets different expectations for each grade level. In seventh grade, students are expected to read and comprehend literature and informational texts in the grades-six-through-eight text complexity band proficiently, with scaffolding as needed at the high end of the range.

Starting in the earliest elementary grades, the CCSS balance reading literature with reading informational text. The increased attention to informational text may lead to some significant changes in elementary instruction as California schools transition to the CCSS. Fewer changes may be necessary in seventh grade because the 1997 California English language arts standards focus on the comprehension and analysis of informational texts. Seventh-grade students continue to read informational texts, including textbooks, magazines, public documents, and online information, which will ease the transition to the CCSS.

An integrated approach to instruction is another feature of the CCSS. Reading is one of the four strands of the CCSS English language arts standards. The skills, concepts, and strategies that students learn in reading connect with and are reinforced by standards in the three other strands. For example, students read a text and analyze how an author structures an argument to support his or her claims and then use their knowledge of structure and organization to produce their own argumentative writing or deliver an oral argument in a formal presentation.

The following section is organized according to the two major areas of the reading standards: reading standards for literature and for informational text.

Reading Standards for Literature

In seventh grade, students read a variety of literature, including novels, dramas, and poems. The literature students read in class must be complex enough to support close reading and deep analysis, as well as thoughtful discussion. By reading a wide range of literature from and about different cultures, with varied themes and in several genres, students become familiar with literary structures and increase their vocabulary. Well-written literature also serves as a model for students' own writing. The challenge for teachers is to select texts that engage students and also support instruction in the CCSS reading standards for literature.

Both the 1997 California standards and the CCSS focus on the analysis of literature as a means of increasing students' comprehension. The development of theme, characters, point of view, and plot are explored in both sets of standards, but the CCSS differ in their depth and scope. In the CCSS, students determine the theme or central idea of a text, analyze its development throughout the text, and provide an objective summary of the text. They use multiple examples of textual evidence to support their summary and analysis of text. Students examine how the elements of a story or drama interact, such as how characters are affected by the setting or the events of a novel.

In addition to determining the meaning of figurative and connotative language as it is used in a text, students consider the impact of rhymes and other repetitions of sounds on a section of a poem, story, or drama. The level of analysis calls for a close reading of the text and for students to think about why an author chooses a particular sound, word, or phrase. Students also analyze how the form or structure of a drama or poem contributes to its meaning (e.g., how the formalized structure of a sonnet helps convey the author's message).

Under the CCSS, students use a compare-and-contrast strategy to analyze literature in both print and other media. For example, students may read a drama and then watch a recorded stage presentation of the same drama. As they compare and contrast the two experiences, students analyze the effects of the sounds they heard and the images seen. They reflect on their understanding of and response to the drama. Reaching across disciplines to connect literature to history, students compare and contrast a fictional portrayal with an historical account of the same time period.

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1. For more information about text complexity, see appendixes A and B of the *Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects*, which is available online at http://www.corestandards.org/the-standards [Outside Source] (accessed February 29, 2012).

Reading Standards for Informational Text

In seventh grade, students evaluate the information, evidence, and reasons that authors provide to support their central ideas and claims. They also examine the organizational structure of text and consider how the author develops point of view. Both the 1997 California English language arts standards and the CCSS cover this content, but the CCSS require deeper analysis and evaluation. Analyzing text to comprehend its content is emphasized in seventh grade to the extent that eight of the 10 standards call explicitly for some type of analysis.

In seventh grade, students evaluate the information, evidence, and reasons authors provide to support their central ideas and claims.

Under the CCSS, students analyze interactions between people, events, and ideas in a text (e.g., how ideas influence events or how events influence ideas). After they have determined an author's point of view or purpose, students analyze how the author distinguishes his or her viewpoint from that of others. Analysis at this level requires students to identify other points of view in addition to the author. This kind of multistep and multilevel analysis builds students' analytical skills and is an important feature of the CCSS at seventh grade.

Students also analyze the structure of text and the use of text features in informational text. For example, students analyze how major sections contribute to the development of the ideas in a text and how graphics in a public document contribute to the whole text. They examine how specific words in a text impact its meaning and tone. They also compare and contrast the impact of words spoken in an audio version of a speech to the impact of reading the words in printed text.

Students analyze how authors who write about the same topic may produce text with different points of view or conclusions by emphasizing different evidence and including different interpretations of facts. This examination of text is another example of the multistep and multilevel analysis called for in the CCSS that will challenge students. Carefully selected texts, teacher modeling, and ample opportunities for practice, along with feedback, will help students develop their analytical skills.

Writing

Students in seventh grade demonstrate sophisticated writing skills to produce pieces that support a clear purpose and include a more cohesive organization of ideas by using evidence from literary and informational texts. Their writing incorporates the use of technology during development, collaboration, and production. Students demonstrate a command of the conventions of the English language and experience with the stages of the writing process (e.g., prewriting, drafting, revising, editing).

Both the 1997 California English language arts standards and the CCSS call for students in seventh grade to write multiparagraph texts with a central idea or theme, relevant supporting details, precise words and visual imagery, and a conclusion. The purposes of writing that students produce are similar under each set of standards. Students write responses to literature, persuasive compositions, research reports, summaries, and narratives under the 1997 California English language arts standards.

The CCSS writing standards identify three main types of writing applications—argument, informative/explanatory, and narrative—and set challenging expectations for students' writing. Students are expected to write routinely in both extended and short time frames for a range of discipline-specific tasks, purposes, and audiences. When writing arguments, students logically organize the reasons and relevant evidence, support claims with credible sources, and address alternate evidence or counterarguments. For informative/explanatory texts, students clearly introduce a topic or thesis and use an extended array of organizational strategies, such as definition, classification, compare/contrast, and cause/effect in addition to graphics, and multimedia resources to aid in comprehension. In their narrative writing, students develop real or imagined events by using sensory language in descriptions to add detail and engage the reader, include well-structured events so the sequence unfolds naturally, and use transition words and phrases for sequencing and

shifting from one time frame to another. Narrative techniques such as dialogue, description, and pacing to develop characters and plot are incorporated.

Technology, including the Internet, plays a larger role in the CCSS. Students use technology in the production of writing, to interact and collaborate with others, and to conduct short research projects to answer a specific question. They learn to gather key information and data from multiple sources and to effectively quote, paraphrase, and cite content (while avoiding plagiarism) in their writing.

Speaking and Listening

Students in seventh grade listen critically to speakers and media presentations for comprehension, identify and analyze information from a variety of media and formats, engage in collaborative discussions, and deliver arguments, narratives, and summary presentations. In their oral presentations, students include multimedia components and visual aids for clarification, use appropriate eye contact and volume, and apply the same conventions of standard English when speaking as in writing.

Both the 1997 California English language arts standards and the CCSS focus on students' listening and comprehension skills and their formal oral presentation skills. Students analyze logical fallacies from a media source and in a speaker's presentation or argument and, in the CCSS, also identify the speaker's attitude toward a subject. When students present claims for findings, they sequence ideas logically and use pertinent details and examples to support the main point or theme.

The CCSS emphasize collaborative discussions on seventh-grade topics and texts with diverse partners and in different groupings (one-on-one, in groups, or teacher-led). In these discussions, students come prepared to add to the discussion by referencing evidence they have read or researched and reflect on ideas being discussed. Students follow rules for collegial discussions with specific goals and deadlines and are assigned individual roles. They contribute comments to the discussion and elaborate on the remarks of others, pose or respond to questions, and, if appropriate, change their own views based on new information presented by others.

Multimedia components as sources of information and complements to oral presentations are another focus of the CCSS. Students in seventh grade analyze information presented in diverse media and formats (e.g., visual, quantitative, oral) and explain how the ideas clarify the topic. They also can distinguish a speaker's argument and attitude and evaluate the soundness and relevance of a speaker's reasons. They use multimedia components (e.g., graphics, images, music, sound) and visual displays to clarify claims and emphasize key points in their presentations. Students learn to adapt their speech to a variety of contexts and tasks and are able to use formal English when it is appropriate.

Language

Students in seventh grade continue to build on language skills initiated in earlier grades and are introduced to new rules for grammar, usage, and punctuation. The specific rules or conventions they learn vary between the 1997 California English language arts standards and the CCSS. Students use their knowledge of language and its conventions when writing, speaking, listening, and reading.

The CCSS are detailed and specific. For example, students explain the function of phrases and clauses as well as explain their function in specific sentences. Students expand their grammatical knowledge as they learn to choose among simple, compound, complex, and compound-complex sentences to signal differing relationships among ideas. Writing clear, coherent, and focused essays is emphasized in the CCSS as students learn to choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.

In the 1997 California English language arts standards, vocabulary development standards are found in the Reading domain. In the CCSS, standards for vocabulary acquisition and use are found in the Language strand. These standards cover a range of strategies for vocabulary acquisition that students use to determine the meaning of words. For example, the CCSS call for students to use context and a word's position or function in a sentence as a clue to determine the meaning of a word or phrase. In addition, students learn to verify their preliminary determination of the meaning of a word or phrase by checking the meaning in context or in a dictionary. Students learn to understand figurative language, word relationships, and nuances of words by distinguishing among the connotations (associations) of words with similar denotations, or definitions (e.g. *refined, respectful, polite, diplomatic,* and *condescending*).

The CCSS stress using relationships between certain words (e.g., synonym/antonym, analogy) to better understand words. Using common Greek or Latin affixes and roots for clues to word meanings is continued as part of the CCSS in seventh grade. The CCSS emphasize students' use of both print and digital sources and general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses) to pronounce words, clarify the precise meaning of a word or its parts of speech, or trace the etymology of words.

Standards for Literacy in History/Social Studies, Science, and Technical Subjects

Unique to the CCSS in grades six through twelve is the addition of standards for literacy in history/social studies, science, and technical subjects. (In kindergarten through grade five, the standards for literacy are embedded in the four strands of the standards.) The addition of these standards for literacy recognizes the role of English language arts teachers in developing students' literacy skills while clarifying that teachers in other content areas also share that responsibility. The standards for literacy recognize the need for students to be proficient in reading complex informational text and writing persuasive and explanatory text in a specific discipline.

The addition of these standards for literacy recognizes the role of English language arts teachers in developing students' literacy skills while clarifying that teachers in other content areas also share that responsibility.

In the CCSS, the standards for literacy in history/social studies, science, and technical subjects focus on reading and writing and are divided into three parts—reading standards for literacy in history/social studies; reading standards for literacy in science and technical subjects; and writing standards for literacy in history/social studies, science, and technical subjects. Standards in each part are organized into grade spans (six through eight, nine and ten, and eleven and twelve) and follow the same set of anchor standards used in English language arts (see Appendix A).

The shared responsibility of developing reading and writing across all content areas is not a new topic of discussion. Over the past 15 years, California's content standards and frameworks have advocated and supported the idea that all teachers share the responsibility for developing student literacy. For example, guiding principles from the *Science Framework for California Public Schools* (California Department of Education 2004) identify what effective science programs do: (1) use standards-based connections with other core subjects to reinforce science teaching and learning; (2) develop students' command of academic language; and (3) use technology to teach students, assess their knowledge, develop information resources, and enhance computer literacy. California's history–social science standards include historical and social science analysis skills. Examples of the skills from grades six through eight are as follows: (1) students frame questions that can be answered by historical study and research; (2) students distinguish fact from opinion in historical narratives and stories; and (3) students understand and distinguish cause, effect, sequence, and correlation in historical events, including the long- and short-term causal relations.

These same skills are identified in the CCSS reading standards in history/social studies and science and technical subjects. The CCSS require the use of specific textual evidence to support analysis of text and to compare and contrast information from different sources (i.e., primary versus secondary sources or doing an

experiment versus reading about it). The CCSS highlight the importance of determining the meaning of content-related or domain-specific words as used in a specific historical or scientific context.

As noted in the English language arts writing section above, the writing standards for literacy in the CCSS extend the types of writing from the 1997 California standards. Students are expected to write arguments based on content in a specific discipline, supporting the topic with relevant and accurate evidence. Informative or explanatory texts may include writing about a scientific procedure or retelling a historical event. All students' writing should be well organized and developed using key facts or details. Students are expected to conduct research projects to answer a specific question, paraphrase or summarize others' work without plagiarizing, and to write consistently within both short and extended time frames.

Extra Support for Struggling Readers

By the end of seventh grade, students are expected to be fluent, independent readers who engage in the analysis of literature and informational text. Students who are not proficient in word-analysis skills are likely to experience academic difficulties. Early screening and intervention address specific areas of instruction in a timely manner. Struggling readers—any students experiencing difficulty learning to read, which may include those who use nonstandard English, English learners, and students with disabilities—should be provided with additional support to become proficient in seventh-grade reading skills. Instructional support for students should include:

Students who are not proficient in word-analysis skills are likely to experience academic difficulties.

- opportunities to preteach key skills, strategies, and concepts;
- intensive, explicit instruction in decoding and word-recognition skills, which may include materials at the reading level of students and that are age-appropriate;
- preteaching and reteaching the use of Greek and Latin affixes and roots as clues to determine the meaning of unknown words;
- preteaching and reteaching word-learning strategies such as using a word's position or function as a clue to determine the meaning of unknown words;
- additional direct, explicit instruction in using informational text to analyze the overall text structure and features;
- additional direct, explicit instruction in using informational text to cite evidence as required in text analysis;
- direct, explicit instruction in language development to address grammatical structures of oral and written standard English;
- vocabulary instruction embedded in context, including academic language and domain-specific vocabulary.

For those students whose reading achievement is two or more years below grade level, placement in an intensive intervention program in reading/language arts should be considered. These stand-alone, accelerated programs are designed to address the instructional needs of students in grades four through eight whose reading achievement is two or more years below grade level. (For additional information on state-adopted intensive intervention programs, see Chapter 9 of the *Reading/Language Arts Framework for California Public Schools* [California Department of Education 2007b] and the list of adopted instructional materials on the CDE Reading/Language Arts Web page at http://www.cde.ca.gov/ci/rl/im/rlaadoptedlist.asp (accessed February 29, 2012).

Support for English Learners

English-language development (ELD) is a critical component of the language arts program for English learners. The CCSS set rigorous expectations for student learning, and ELD instruction must accommodate these enhanced expectations.

Careful placement of English learners in appropriate classes is of utmost consideration. Students in seventh grade need to be assessed to determine the appropriate program placement whether it be an ELD class, an English language arts mainstream class, specially designed academic instruction in English, or a combination of classes. Research by Dutro and Kinsella (California Department of Education 2010b) contends that students at the more advanced levels, such as the intermediate and early advanced levels, benefit from instruction that develops complex language structures, sophisticated vocabulary, and reading comprehension, as well as explicit guided writing instruction to strengthen students' writing abilities.

English learners develop oral and written language through ELD instruction that addresses ELD standards; emphasizes structured, engaging, and purposeful oral language development; focuses on vocabulary development(including academic vocabulary); and targets knowledge of grammatical structures and patterns taught through a structured scope and sequence. Effective ELD instruction also integrates reading and writing applications to build reading comprehension.

Of equal importance is placement (or misplacement) of English learners in reading intervention classes. The aim of reading intervention classes is to support the development of basic knowledge and skills of decoding multisyllabic words, reading fluency, vocabulary-learning strategies, and comprehension strategies, not developing oral language proficiency. In *Improving Education for English Learners: Research-Based Approaches* (California Department of Education 2010b), August and Shanahan suggest that the placement of English learners be carefully considered; placement in reading intervention classes alone will not provide the language development offered in structured and focused ELD classes that address ELD standards.

As English learners participate and engage in collaborative discussions, they are given ample opportunities to hear vocabulary acquired from their reading. Students learn to respond to questions and elaborate on discussion topics with relevant observations and ideas as they express themselves…

Students in seventh grade are expected to conduct deep analysis of literature and informational text on grade-level topics in all subject areas. English learners benefit from differentiated instruction as they learn how to analyze the structure of informational text and how text features contribute to the development of the ideas in text. With guided instruction, students will also learn how to cite textual evidence that most strongly supports their statements and inferences in their analysis of text.

When provided with differentiated instruction using informational text, English learners can practice using academic language as well as domain-specific words in different content areas. As English learners participate and engage in collaborative discussions, they are given ample opportunities to hear and practice using vocabulary acquired from their reading. Students learn to respond to questions and elaborate on discussion topics with relevant observations and ideas as they express themselves during one-on-one, small group, or teacher-led discussions.

The CCSS emphasize writing arguments and English learners will benefit from explicit, guided instruction and models of written arguments. Additional instruction in how to acknowledge and distinguish opposing claims, use credible sources, and establish and maintain a formal style of writing will ensure adequate mastery of those skills. Scaffolds such as sentence and paragraph frames for writing informative and explanatory texts will enable English learners in the early stages of learning English to improve their writing abilities. Guided instruction on developing a thesis statement, organizing ideas, and including well-chosen facts, concrete details, quotations, and a conclusion reinforces valuable skills. Because English learners are still developing proficiency in English, they benefit from teachers' positive and corrective feedback on writing and grammatical errors.

English learners may need additional time and practice in writing for a variety of purposes and audiences to further their writing abilities.

English learners develop oral and written language through formal linguistic instruction that includes learning common phrases, idiomatic expressions, and language patterns as well as phonological, morphological, syntactical, and semantic structures of English.

Explicit instruction on the rules of grammar and the functions of phrases and clauses in sentences enables English learners to enhance their writing skills. Additional practice in placing clauses within a sentence and recognizing and correcting misplaced modifiers may strengthen the writing abilities of English learners. Students are provided with multiple opportunities to practice these skills both in speaking and writing and receive corrective teacher feedback.

For those students whose academic achievement is two or more years below grade level, placement in an intensive intervention program for English learners should be considered. These stand-alone, accelerated programs are designed for English learners in grades four through eight whose academic achievement is two or more years below grade level. (For additional information on state-adopted intensive intervention programs for English learners, see Chapter 9 of the *Reading/Language Arts Framework for California Public Schools* [California Department of Education 2007b] and the list of adopted instructional materials on the CDE Reading/Language Arts Web page at http://www.cde.ca.gov/ci/rl/im/rlaadoptedlist.asp (accessed February 29, 2012).

Specially designed academic instruction in English (SDAIE) is one instructional strategy to meet the needs of English learners. For additional resources to support the teaching of English learners, please visit the CDE English Learners Web page at http://www.cde.ca.gov/sp/el/ (accessed February 29, 2012). The CDE has published an excellent resource, *Improving Education for English Learners: Research-Based Approaches* (2010b), with the most comprehensive and up-to-date strategies to serve English learners. Guidelines for using ELD and SDAIE strategies, as well as recommended instructional practices, are provided. Information on the publication is available through the CDE Press Web page at http://www.cde.ca.gov/re/pn/rc/ (accessed February 24, 2012).

English learners need additional time and appropriate instructional support. The CDE publication *A Look at Kindergarten Through Grade Six in California Public Schools: Transitioning to the Common Core State Standards in English Language Arts and Mathematics* (2011c) provides charts for planning ELD instruction in kindergarten through grade six. The charts illustrate the enhancements in the CCSS for English language arts that may affect ELD instruction. The CCSS set rigorous expectations for student learning which has created growing gaps of articulation with the current English-Language Development Standards adopted in 1999. These gaps grow larger with each grade level. By grade seven, the necessary enhancements are more extensive. A chart of the gaps would be less than useful to educators; therefore, it has not been included in this grade-level document.

Recent legislation requires the updating of the English-Language Development Standards to provide English learners with clearer pathways to the English language arts CCSS. This process is expected to be completed by the fall of 2012. For more information, visit the CDE Web page at http://www.cde.ca.gov/sp/el/er/ (accessed February 29, 2012).

The Standards

The CCSS, with California additions, that follow are the prepublication version of the standards prepared by the Sacramento County Office of Education (SCOE), updated on October 15, 2010. Content that is unique to California and was added by California to the multistate common core standards is in **bold typeface and underlined**. The SCOE document is available online at http://www.scoe.net/castandards/agenda/2010/ela_ccs_recommendations.pdf [Outside Source] (accessed February 29, 2012). The grade-seven CCSS for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects were adopted by the California State Board of Education on August 2, 2010. The CCSS College and Career Readiness (CCR) Anchor Standards (Appendix A) define the literacy expectations for students entering college and careers and provide the foundation of the K–12 English language arts standards. Although the CCR Anchor Standards were not part of the State Board of Education action in August, they are essential to understanding the structure and cohesive nature of the CCSS.

A complete list of the 1997 California English language arts standards for grade seven is located on the CDE Content Standards Web page at http://www.cde.ca.gov/be/st/ss/documents/elacontentstnds.pdf (accessed February 29, 2012).

Common Core State Standards with California Additions English Language Arts: Grade Seven	
Reading Standards for Literature	
Key Ideas and Details	
1.	Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
2.	Determine a theme or central idea of a text and analyze its development over the course of the text; provide an objective summary of the text.
3.	Analyze how particular elements of a story or drama interact (e.g., how setting shapes the characters or plot).
Craft and Structure	
4.	Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of rhymes and other repetitions of sounds (e.g., alliteration) on a specific verse or stanza of a poem or section of a story or drama. **(See grade 7 Language standards 4-6 for additional expectations.)**
5.	Analyze how a drama's or poem's form or structure (e.g., soliloquy, sonnet) contributes to its meaning.
6.	Analyze how an author develops and contrasts the points of view of different characters or narrators in a text.

Integration of Knowledge and Ideas	
7.	Compare and contrast a written story, drama, or poem to its audio, filmed, staged, or multimedia version, analyzing the effects of techniques unique to each medium (e.g., lighting, sound, color, or camera focus and angles in a film).
8.	(Not applicable to literature)
9.	Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history.
Range of Reading and Level of Text Complexity	
10.	By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.
Reading Standards for Informational Text	
Key Ideas and Details	
1.	Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
2.	Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.
3.	Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events).
Craft and Structure	
4.	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone. **(See grade 7 Language standards 4-6 for additional expectations.)**
5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas. **a. Analyze the use of text features (e.g., graphics, headers, captions) in public documents.**
6.	Determine an author's point of view or purpose in a text and analyze how the author distinguishes his or her position from that of others.
Integration of Knowledge and Ideas	
7.	Compare and contrast a text to an audio, video, or multimedia version of the text, analyzing each medium's portrayal of the subject (e.g., how the delivery of a speech affects the impact of the words).

8.	Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.
9.	Analyze how two or more authors writing about the same topic shape their presentations of key information by emphasizing different evidence or advancing different interpretations of facts.
Range of Reading and Level of Text Complexity	
10.	By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.
Writing Standards	
Text Types and Purposes	
1.	Write arguments to support claims with clear reasons and relevant evidence. a. Introduce claim(s), acknowledge **and address** alternate or opposing claims, and organize the reasons and evidence logically. b. Support claim(s) **or counterarguments** with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), reasons, and evidence. d. Establish and maintain a formal style. e. Provide a concluding statement or section that follows from and supports the argument presented.
2.	Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. a. Introduce a topic **or thesis statement** clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/ effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples. c. Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Establish and maintain a formal style.

	f. Provide a concluding statement or section that follows from and supports the information or explanation presented.
3.	Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences. a. Engage and orient the reader by establishing a context and point of view and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically. b. Use narrative techniques, such as dialogue, pacing, and description, to develop experiences, events, and/or characters. c. Use a variety of transition words, phrases, and clauses to convey sequence and signal shifts from one time frame or setting to another. d. Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events. e. Provide a conclusion that follows from and reflects on the narrated experiences or events.
Production and Distribution of Writing	
4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
5.	With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 7.)
6.	Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.
Research to Build and Present Knowledge	
7.	Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.
8.	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
9.	Draw evidence from literary or informational texts to support analysis, reflection, and research. a. Apply grade 7 Reading standards to literature (e.g., “Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history”).

	b. Apply grade 7 Reading standards to literary nonfiction (e.g. "Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims").
Range of Writing	
10.	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
Speaking and Listening Standards	
Comprehension and Collaboration	
1.	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 7 topics, texts, and issues,* building on others' ideas and expressing their own clearly. a. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion. b. Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed. c. Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed. d. Acknowledge new information expressed by others and, when warranted, modify their own views.
2.	Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.
3.	Delineate a speaker's argument and specific claims, **and attitude toward the subject,** evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.
Presentation of Knowledge and Ideas	
4.	Present claims and findings **(e.g., argument, narrative, summary presentations),** emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation. **a. Plan and present an argument that: supports a claim, acknowledges counterarguments, organizes evidence logically, uses words and phrases to create cohesion, and provides a concluding statement that supports the argument presented.**

5.	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
6.	Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 7 Language standards 1 and 3 for specific expectations.)
	Language Standards
Conventions of Standard English	
1.	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. a. Explain the function of phrases and clauses in general and their function in specific sentences. b. Choose among simple, compound, complex, and compound-complex sentences to signal differing relationships among ideas. c. Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.*
2.	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. a. Use a comma to separate coordinate adjectives (e.g., *It was a fascinating, enjoyable movie* but not *He wore an old[,] green shirt*). b. Spell correctly.
Knowledge of Language	
3.	Use knowledge of language and its conventions when writing, speaking, reading, or listening. a. Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.*
Vocabulary Acquisition and Use	
4.	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 7 reading and content*, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.

* The following skills are particularly likely to require continued attention in higher grades as they are applied to increasingly sophisticated writing and speaking. See the chart "Language Progressive Skills, by Grade" on page 47 in the CCSS.

	b. Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., *belligerent, bellicose, rebel*). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech **or trace the etymology of words**. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
5.	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. a. Interpret figures of speech (e.g., literary, biblical, and mythological allusions) in context. b. Use the relationship between particular words (e.g., synonym/antonym, analogy) to better understand each of the words. c. Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., *refined, respectful, polite, diplomatic, condescending*).
6.	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Common Core State Standards with California Additions
Reading Standards for Literacy in History/Social Studies, Science, and Technical Subjects
Grades Six Through Eight

Reading Standards for Literacy in History/Social Studies	
Key Ideas and Details	
1.	Cite specific textual evidence to support analysis of primary and secondary sources.
2.	Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.
3.	Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).
Craft and Structure	
4.	Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.

5.	Describe how a text presents information (e.g., sequentially, comparatively, causally).
6.	Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).
Integration of Knowledge and Ideas	
7.	Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.
8.	Distinguish among fact, opinion, and reasoned judgment in a text.
9.	Analyze the relationship between a primary and secondary source on the same topic.
Range of Reading and Level of Text Complexity	
10.	By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.

Reading Standards for Literacy in Science and Technical Subjects	
Key Ideas and Details	
1.	Cite specific textual evidence to support analysis of science and technical texts.
2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
Craft and Structure	
4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6–8 texts and topics*.
5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
6.	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.
Integration of Knowledge and Ideas	
7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
8.	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
Range of Reading and Level of Text Complexity	
10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.
Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects	
Text Types and Purposes	
1.	Write arguments focused on *discipline-specific content*. a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources. c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. d. Establish and maintain a formal style. e. Provide a concluding statement or section that follows from and supports the argument presented.
2.	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Establish and maintain a formal style and objective tone.

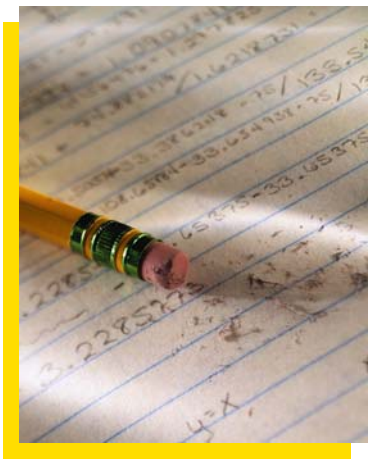
	f. Provide a concluding statement or section that follows from and supports the information or explanation presented.
3.	(See note; not applicable as a separate requirement*)
Production and Distribution of Writing	
4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5.	With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.
6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.
Research to Build and Present Knowledge	
7.	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
8.	Gather relevant information from multiple print and digital sources **(primary and secondary)**, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
9.	Draw evidence from informational texts to support analysis reflection, and research.
Range of Writing	
10.	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

California additions are in **bold typeface and underlined**.

* **Note**: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historical import. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.

Mathematics

Overview



Effective mathematics education provides students with a balanced instructional program. In such a program, students become proficient in basic computational skills and procedures, develop conceptual understandings, and become adept at problem solving. Standards-based mathematics instruction starts with foundational mathematical ideas and increases in scope and content as the years progress. It is like an inverted pyramid, with the entire weight of the developing subject, including readiness for algebra, resting on the foundations built in the early grades.

In August 2010, California adopted new standards in mathematics, the Common Core State Standards (CCSS), with California additions. The CCSS comprise standards developed by the state-led Common Core State Standards Initiative and material taken from the 1997 California mathematics standards. The new standards will be implemented gradually over the next several years as curriculum frameworks, instructional materials, and assessments based on the CCSS are adopted.

There are many similarities between the CCSS and the 1997 California mathematics standards, but there are also noteworthy differences. For instance, the CCSS include standards for mathematical practice, which apply to all grade levels, as well as content standards for each grade level. The standards for mathematical practice will be discussed in more detail in the next section and are also included in Appendix B. In addition, the CCSS are organized by "domains" that add grade-level focus and vary slightly by grade. The domains for seventh grade are Ratios and Proportional Relationships, the Number System, Expressions and Equations, Geometry, and Statistics and Probability. Furthermore, the CCSS do not include "key standards" as in the 1997 California mathematics standards. Instead, the CCSS are designed to be more focused at each grade and to develop mathematics topics in greater depth. In the early grades, the CCSS continue to emphasize concepts necessary for the study of more advanced mathematics in later years.

This section provides an overview of the new CCSS for seventh-grade mathematics, including some highlights of how the seventh-grade curriculum, based on the 1997 California mathematics standards, will change with the implementation of the new CCSS. It also includes guidance on areas of mathematics that may be challenging for some English learners. A complete list of the seventh-grade CCSS for mathematics can be found at the end of this section. A complete list of the 1997 California mathematics standards for seventh grade is located on the CDE Content Standards Web page at http://www.cde.ca.gov/be/st/ss/documents/mathstandard.pdf (accessed on February 29, 2012).

What Students Learn in Seventh Grade

Standards for Mathematical Practice

There are two types of mathematical standards: the standards for mathematical practice, which are the same from kindergarten to grade twelve, and the standards for mathematical content, which are different for each grade level. The mathematical practice standards describe what mathematics educators at all levels should develop in their students. The mathematical practice standards support essential "processes and proficiencies" that deepen students' conceptual understanding of mathematics. Doing and using mathematics involves connecting mathematical content and practices. Mathematical content standards that call for students to "understand" or "explain" are potential points of intersection between the standards for mathematical content and those for mathematical practice.

The mathematical practice support essential "processes and proficiencies" that deepen students' conceptual understanding of mathematics.

The following chart provides a general overview of the standards for mathematical practice. For a more detailed explanation of each standard, see Appendix B.

Standards for Mathematical Practice	Summary
1. Make sense of problems and persevere in solving them	• Find meaning in problems. • Analyze, predict, and plan solution pathways. • Verify answers. • Students ask themselves the question: "Does this make sense?"
2. Reason abstractly and quantitatively	• Make sense of quantities and their relationships in problems. • Create coherent representations of problems.
3. Construct viable arguments and critique the reasoning of others	• Understand and use information to construct arguments. • Make and explore the truth of conjectures. • Justify conclusions and respond to arguments of others.
4. Model with mathematics	• Apply mathematics to problems in everyday life. • Identify quantities in a practical situation. • Interpret results in the context of the situation and reflect on whether the results make sense.
5. Use appropriate tools strategically	• Consider the available tools when solving problems. • Are familiar with tools appropriate for their grade or course (pencil and paper, concrete models, ruler, protractor, calculator, spreadsheet, computer programs, digital content located on a Web site, and other technological tools).
6. Be precise	• Communicate precisely to others. • Use clear definitions, state the meaning of symbols, and are careful about specifying units of measure and labeling axes.

	• Calculate accurately and efficiently.
7. Look for and make use of structure	• Discern patterns and structures. • Can step back for an overview and shift perspective. • See complicated things as single objects or as being composed of several objects.
8. Look for and identify ways to create shortcuts when doing problems	• When calculations are repeated, look for general methods, patterns, and shortcuts. • Be able to evaluate whether an answer makes sense.

Source: Adapted from the *Common Core Standards Parent Handbook* (California County Superintendents Educational Services Association 2011).

Standards for Mathematical Content

In the seventh-grade content standards, students extend their understanding of proportional relationships and solve related real-world and mathematical problems. They apply their understanding of operations with fractions to add, subtract, multiply, and divide rational numbers. They are introduced to irrational numbers. Students use the properties of operations to generate equivalent expressions. Students use facts about angles to write and solve simple equations for an unknown angle and they solve problems involving the volumes of cones, cylinders, and spheres. Students extend their understanding of statistics and draw inferences about populations based on samples. They also investigate chance events and work with probability models.

As noted in the Overview, the adoption of the CCSS in mathematics included some California additions. In seventh grade, in order to help prepare students for algebra in eighth grade, these additions include the introduction of some CCSS from eighth grade. In addition, some seventh-grade standards are introduced in sixth grade.

Ratios and Proportional Relationships

In the seventh-grade CCSS, students analyze proportional relationships and solve related real-world and mathematical problems. Students extend their understanding of ratios to compute unit rates[1] associated with ratios of fractions. For example, they find the walking speed of a person who walks 1/2 mile in each 1/4 hour. Students identify unit rates in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

Students recognize and represent proportional relationships between quantities. They decide if two quantities are in a proportional relationship, for example, by graphing two quantities on a coordinate plane and observing whether the graph is a straight line through the origin. They also represent proportional relationships by equations; for example, if total cost t is proportional to the number n of items purchased at a constant price p, then the relationship between the total cost and the number of items can be expressed as $t = pn$. Students use proportional relationships to solve multistep ratio and percent problems such as problems about simple interest, tax, markups and markdowns, tips, and percent increase and decrease.

With full implementation of the CCSS, some concepts in the 1997 California mathematics standards will be covered at different grades. For example, solving problems involving discounts, interest, and tips and representing proportional relationships with equations, topics covered in sixth grade in the 1997 mathematics standards, will be covered in seventh grade in the CCSS.

1. The ratio A units to B units has associated with it the *rate* A/B units to 1 unit. The associated *unit rate* is the number $\frac{A}{B}$.

The Number System

Seventh-grade students apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers, which include negative numbers. Students review CCSS concepts introduced in sixth grade as they add and subtract rational numbers. Students understand $p + q$ as the number located a distance $|q|$ from p on a number line, in the positive or negative direction, depending on whether q is positive or negative. They demonstrate that a number and its opposite have a sum of 0 (are additive inverses), and they understand subtraction of rational numbers as adding the additive inverse. Students extend multiplication of fractions to rational numbers, and they apply properties of operations as strategies to multiple and divide rational numbers. Students understand that properties of operations, such as the distributive property, apply to all rational numbers, leading to products such as $(–1)\ (–1) = 1$ and the rules for multiplying signed numbers. Student realize that each quotient of integers (with a nonzero divisor) is a rational number and if p and q are integers, then $– (p/q) = (–p)/q = p/ (–q)$. Ultimately, students use the four operations with rational numbers to solve real-world and mathematical problems.

Irrational numbers are introduced in seventh grade. Irrational numbers, such as $\sqrt{2}$, cannot be expressed as fractions with an integer numerator and denominator; equivalently, they cannot be expressed as terminating or repeating decimals. Students use rational approximations of irrational numbers to compare the size of irrational numbers, approximate the location of irrational numbers on a number line diagram, and estimate the value of expressions (e.g., π^2).

With full implementation of the CCSS, multiplication and division with negative integers, a sixth-grade topic in the 1997 California standards, will move to seventh grade in the CCSS.

Expressions and Equations

Seventh-grade students use the properties of operations to generate equivalent expressions. Students begin to simplify complex linear expressions with rational coefficients, such as $7 - 2(3 - 8x)$. Students add, subtract, factor and expand linear expressions, and they realize that rewriting an expression in different forms can help them solve problems. For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”

Students solve multistep, real-life mathematical problems with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), and they assess the reasonableness of their answers. They use variables to represent quantities and construct simple equations and inequalities to solve problems. Students solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$ and inequalities of the form $px + q > r$ or $px + q < r$, where p, q and r are rational numbers. Students graph the solution set of the inequality and interpret it in the context of the problem.

Students use square root and cube root symbols and evaluate the square roots of small, perfect squares (e.g., $\sqrt{25}$) and cube roots of small, perfect cubes.

Building on concepts learned in earlier grades, students use numbers multiplied by powers of 10 to estimate and compare very large and very small quantities.

With full implementation of the CCSS, the slope of a line and graphing and interpreting linear and nonlinear functions are examples of seventh-grade topics in the 1997 California standards that will move to eighth grade.

Geometry

Seventh-grade students work with various geometric figures. They solve problems involving scale drawings of geometric figures; they compute lengths and areas and reproduce a scale drawing at a different scale. Students work with three-dimensional figures and relate them to two-dimensional figures by examining cross-sections that result when three-dimensional figures are split. Students also describe how two or more objects are related in space (e.g., skewed lines and the possible ways three planes might intersect).

Students review concepts introduced in sixth grade, including how to draw geometric shapes with given conditions (such as triangles from three measures of angles) and the formulas for calculating the area and circumference of a circle.

Students use facts about supplementary, complementary, vertical, and adjacent angles in a multistep problem to write and solve simple equations to find an unknown angle in a figure.

Students extend their understanding of area as they solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. Students also solve problems involving the volume of cones, cylinders, and spheres.

With full implementation of the CCSS, some topics will be covered at different grades. For example, how to compute surface area and draw polygons in the coordinate plane, covered at seventh grade in the 1997 California standards, will move to sixth grade in the CCSS. Also, the Pythagorean theorem, a seventh-grade topic in the 1997 California standards, will move to eighth grade in the CCSS.

Statistics and Probability

Students are introduced to statistics in sixth grade. In seventh grade, they extend their work with single data distributions to compare two data distributions and address questions about differences between populations.

Seventh-grade students begin informal work with random sampling. They use data from a random sample to draw inferences about a population with an unknown characteristic. For example, they predict the winner of a school election based on randomly sampled survey data. Students also use measures of center and variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, they decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.

Students investigate the concept of chance to develop, use, and evaluate probability models. Seventh-grade students learn that the probability of a chance event is a number between 0 and 1 (a probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event). Students collect data related to a chance process and predict the approximate, relative frequency given the probability. For example, when rolling a number cube 600 times, students predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times. Students develop and use probability models to find the probabilities of events. They use organized lists, tables, tree diagrams, and simulations to find the probabilities of compound events. For example, if 40 percent of donors have type A blood, what is the probability that it will take at least four donors to find one with type A blood?

With full implementation of the CCSS, the probability of a chance event will be introduced and developed at seventh grade. In the 1997 California standards, students begin to use probability data to predict future events in third grade and then extend their work with probability through sixth grade.

Support for English Learners

Students need to develop knowledge of mathematics as a language. The linguistic complexity and unfamiliar academic language of mathematics instruction may pose particular challenges for English learners. The language of mathematics has its own precise and discipline-specific meanings. English learners need opportunities to develop their knowledge of the features of language that are used to teach mathematics, such as *semantics* (how to translate the words of a problem into a symbolic representation), and *mathematical discourse* (writing or talking about mathematical terms, concepts, and so on).

The specialized vocabulary of mathematics should be explicitly taught and reinforced throughout the year. *Explain, prove, justify, determine, solve, identify, analyze, compare, estimate, interpret, generate, locate, illustrate, obtain, reproduce,* and *summarize* are examples of verbs that are commonly used in mathematics and may pose challenges for English learners. Specialized vocabulary encountered in mathematics that may require additional explanation includes nouns such as *diagram, scale drawing, derivation, evidence, expression, display, measurement data,* and *rational* and *irrational numbers*. Attention must also be paid to words that have a different meaning in common discourse than in mathematics—such as *set, table, digit, plane, space, round, point,* and *field*.

Students are expected to explain and apply concepts they encounter and procedures in solving real-world and mathematical problems. They construct and present well-defined, plausible arguments. Although students may use models, diagrams, or drawings to explain some concepts or present an argument, other problems will require that students produce an oral or written response. English learners can successfully engage in these learning opportunities with teacher guidance and multiple practice opportunities. Teachers should also be aware that students may have learned different symbols and procedures that could result in the same answer. In some countries, students are expected to do most steps mentally instead of writing out each step.

English learners may benefit from instructional support such as the following:

- Daily opportunities to engage in mathematical discourse by using new vocabulary and explaining the operations used in problem solving
- Opportunities to listen to or read others' arguments and decide if they are strongly supported
- Use of the students' first language to make instruction in English more effective and the vocabulary of mathematics more comprehensible
- Use of individualized or small-group instruction
- Scaffolded instruction and models for constructing arguments that include support and justification for their reasoning, responding to the arguments of others, and asking or answering clarifying questions

Instruction in mathematics that develops procedural proficiency, along with conceptual understanding and critical-thinking skills, should be promoted despite low literacy or limited proficiency in the English language. Specially designed academic instruction in English (SDAIE) is one instructional strategy to meet the needs of English learners. For additional resources to support the teaching of English learners, please visit the CDE English Learners Web page at http://www.cde.ca.gov/sp/el/ (accessed February 29, 2012).

Use of Calculators

The use of calculators and other technology plays a special role in mathematics teaching and learning. In seventh grade, students are ready to use calculators, including graphing calculators, geometry software, modeling software, and electronic resources to their advantage. Technology may be a useful tool for solving problems in various contexts, broadening students' mathematical horizons, and visually demonstrating complex mathematical problems. Technology also provides access to Internet sources for data to support solving real-world problems.

The Standards

The CCSS, with California additions, that follow are the prepublication version of the standards prepared by the Sacramento County Office of Education (SCOE), updated on October 18, 2010. Content that is unique to California and was added to the multistate common core standards is in **bold typeface and underlined**. The SCOE document is available online at http://www.scoe.net/castandards/agenda/2010/math_ccs_recommendations.pdf [Outside Source] (accessed February 29, 2012). These grade-seven CCSS for mathematics were adopted by the California State Board of Education on August 2, 2010.

A complete list of the grade-seven 1997 California mathematics standards is located on the CDE Content Standards Web page at http://www.cde.ca.gov/be/st/ss/documents/mathstandards.pdf (accessed March 1, 2012).

Common Core State Standards with California Additions Mathematics: Grade Seven	
Ratios and Proportional Relationships (7.RP)	
Analyze proportional relationships and use them to solve real-world and mathematical problems.	
1.	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction* $^{1/2}/_{1/4}$ *miles per hour, equivalently 2 miles per hour.*
2.	Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

	c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.
3.	Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*
	The Number System (7.NS)
Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	
1.	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* b. Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. a. Understand subtraction of rational numbers as adding the additive inverse, $p – q = p + (–q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. d. Apply properties of operations as strategies to add and subtract rational numbers.
2.	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(–1)(–1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $–(p/q) = (–p)/q = p/(–q)$. Interpret quotients of rational numbers by describing real world contexts. c. Apply properties of operations as strategies to multiply and divide rational numbers.

	d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
3.	Solve real-world and mathematical problems involving the four operations with rational numbers.[1]
Know that there are numbers that are not rational, and approximate them by rational numbers.	
4.	**Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. (Common Core Standard 8NS-1)**
5.	**Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations. (Common Core Standard 8NS-2)**
Expressions and Equations (7.EE)	
Use properties of operations to generate equivalent expressions.	
1.	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
2.	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*
Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	
3.	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*
4.	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an

1. Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

	algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*
5.	**Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. (Common Core Standard 8EE-2)**
6.	**Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger. (Common Core Standard 8EE-3)**
Geometry (7.G)	
Draw, construct, and describe geometrical figures and describe the relationships between them.	
1.	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
2.	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
3.	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
3.1	**Describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect).**
Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	
4.	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
5.	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
6.	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Solve real-life and mathematical problems involving volume of cylinders, cones, and spheres.	
7.	**Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. (Common Core Standard 8G-9)**
Statistics and Probability (7.SP)	
Use random sampling to draw inferences about a population.	
1.	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
2.	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*
Draw informal comparative inferences about two populations.	
3.	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*
4.	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*
Investigate chance processes and develop, use, and evaluate probability models.	
5.	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
6.	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*
7.	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

8.	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*
	Standards for Mathematical Practice 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning. The CCSS for Mathematical Practice describe ways in which students of mathematics ought to engage with the subject matter as they grow in mathematical maturity and expertise. For a complete description of the eight Standards for Mathematical Practice, see Appendix B.

CCSS Domains

The CCSS are organized by domains. The following table lists all of the domains that apply to kindergarten through grade eight, and it identifies which domains are addressed in grades seven and eight. The shaded rows indicate domains covered in earlier grades.

Domains	Grade Seven	Grade Eight
Counting and Cardinality (CC)		
Operations and Algebraic Thinking (OA)		
Numbers and Operations in Base Ten (NBT)		
Measurement and Data		
Number and Operations-Fractions		
Geometry	**X**	**X**
Ratios and Proportional Relationships (RP)	**X**	
The Number System (NS)	**X**	**X**
Expressions and Equations (EE)	**X**	**X**
Statistics and Probability (SP)	**X**	**X**
Functions (F)		**X**

Eighth-Grade Curriculum

What will my child learn in English language arts and mathematics in eighth grade?

In August 2010, the state adopted the Common Core State Standards for English language arts and mathematics. How will the new standards enhance eighth-grade curriculum?

This chapter contains two sections—English language arts and mathematics—that describe what students should know and be able to do by the end of eighth grade. Each section includes a brief description of the eighth-grade standards, concluding with a list of the eighth-grade standards for the Common Core State Standards (CCSS), with California additions, for English language arts and mathematics.

English Language Arts

Overview

In preparation for high school and beyond, students in eighth grade must have a firm grasp of skills to be a literate person in the twenty-first century. They read and respond to significant works of literature and examine how modern works of fiction draw on traditional themes and characters. Given informational text, students read critically the arguments and specific claims in a text, assessing whether the author's evidence is reasoned and sufficient in addressing conflicting evidence and viewpoints. Students, working on their own and with others, produce clear and coherent texts appropriate to the task, purpose, and audience. Students connect their reading to their writing by drawing evidence from literary and informational texts when writing analyses or short research projects. Eighth-grade students build on the communication and collaboration skills from earlier grades. As they engage in collaborative discussions, they probe and reflect on discussion topics and are able to justify their own views in light of evidence presented by others. Students continue to acquire and accurately use general academic language and domain-specific vocabulary. They recognize when it is important to know the precise meaning of a word in order to comprehend a text and call upon a range of strategies to determine word meanings.

There are many similarities between the CCSS and the 1997 California English language arts standards, but there are also some notable differences. For instance, in the CCSS, the standards in eighth grade are divided into strands: Reading, Writing, Speaking and Listening, and Language. The 1997 California standards are organized around domains: Reading, Writing, Written and Oral English Language Conventions, and Listening and Speaking. An organizational change in the CCSS for grades six through twelve is the inclusion of another set of standards: Reading and Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects. They are not intended to replace existing standards in those content areas; instead, they supplement instruction and provide consistency in expectations across the curriculum. The standards also call for collaboration across disciplines and acknowledge the important role of teachers in every subject area to prepare students for college and careers.

This section provides an overview of the new CCSS for eighth-grade English language arts. It includes guidance to ensure success for struggling readers and English learners. A complete list of the grade-eight CCSS for English language arts, with California additions, can be found at the end of this section. A complete list of the grade-eight 1997 California English language arts standards is located on the CDE Content Standards Web page at http://www.cde.ca.gov/be/st/ss/documents/elacontentstnds.pdf (accessed February 23, 2012).

What Students Learn in Eighth Grade

Reading

Three important emphases of the CCSS in reading are text complexity, a balance between literature and informational text, and an integrated approach to instruction. The term *text complexity band* is the focus of Standard 10 in the reading standards for literature, for informational text, and in the reading standards for literacy in

history/social studies, science, and technical subjects. Standard 10 sets the expectation that students will read increasingly complex text each year from second grade through high school.[1] The text complexity band for grades six through eight sets different expectations for each grade level. In eighth grade, students are expected to read literature and informational texts in the grades-six-through-eight text complexity band independently and proficiently.

Starting in the earliest elementary grades, the CCSS balance reading literature with reading informational text. The increased attention to informational text may lead to some significant changes in elementary instruction as California schools transition to the CCSS. Fewer changes may be necessary at eighth grade because the 1997 California standards focus on the comprehension and analysis of informational texts. Like the CCSS, the 1997 standards consist of an equal number of standards in each of the two components of reading. Under the 1997 standards, eighth-grade students read informational texts, including textbooks, magazines, consumer materials (warranties, product information, instruction manuals), and online information. Students also use information from consumer, workplace, and public documents to explain a situation or solve a problem. Teachers' familiarity with those standards will ease the transition to the CCSS.

An integrated approach to instruction is another feature of the CCSS. Reading is one of the four strands of the CCSS for English language arts. The skills, concepts, and strategies that students learn in reading connect with and are reinforced by standards in the other three strands. For example, students read a text, analyze how an author structures an argument to support his or her claims, and then use their knowledge of the structure and organization to produce their own arguments in writing or deliver an oral argument in a formal presentation.

The following section is organized according to the two major areas of the reading standards: reading standards for literature and for informational text.

Reading Standards for Literature

In eighth grade, students read and analyze a range of literary texts. The literature that students read in class must be complex enough to merit close reading and deep analysis, as well as thoughtful discussion. By reading a wide range of literature from and about different cultures, with varied themes and set in different time periods, students become familiar with different literary structures and better understand analogies or allusions used in texts. Well-written literature also serves as a model for the students' own writing. The challenge for teachers is to select texts that engage students and also support instruction in the CCSS reading standards for literature.

Both the 1997 standards and the new CCSS focus on analysis of literature as a means of increasing students' comprehension and critical thinking skills. The development of theme, characters, point of view, and plot are explored in both sets of standards, but the CCSS differ in depth and scope. As their analytical skills become more sophisticated, students in eighth grade compare and contrast structures of different texts, probe the relationships between elements of a text (e.g., characters, setting, plot) and its central theme, and analyze how modern works draw from significant works of the past.

A new eighth-grade expectation is that students will learn to cite textual evidence that *most strongly* supports their own analysis of a text. Instruction and practice in earlier grades in analyzing an author's development of a theme or central idea prepares students to evaluate the strength of the textual evidence they cite. In addition, students explore how a line of dialogue or an incident in a story or drama can propel the action, reveal something about a character, or provoke a decision. Close reading and thoughtful analysis help students understand how an author uses different points of view to create effects such as suspense or humor.

Students view film versions or live presentations of stories or dramas and analyze how faithful the production is to the original text or script. As part of that analysis, they evaluate the choices made by the

1. For more information about text complexity, see appendixes A and B of the *Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects*, which are available at http://www.corestandards.org/the-standards [Outside Source] (accessed March 1, 2012).

director or actors. Students read modern works of fiction in the context of myths, traditional stories, and religious works and look for common themes, patterns of events, or types of characters. English language arts and history–social science teachers can reach across disciplines to connect literature to history by jointly selecting significant literature from the past for students to read and compare with modern fiction.

Reading Standards for Informational Text

Eighth-grade students evaluate the information, evidence, and reasons that authors provide to support central ideas and claims. They also examine how an author responds to conflicting evidence, the organizational structure of text, and the use of text features to convey key concepts. Both the 1997 California standards and the CCSS cover this content, but the CCSS require deeper analysis and evaluation. Another important way that the CCSS differ from the 1997 standards is a focus on the different media (e.g. printed or digital text, video, audio, or multimedia) for presenting information.

Eighth-grade students evaluate the information, evidence, and reasons that authors provide to support central ideas and claims.

Under the CCSS, students analyze the development of the central idea over the course of a text, including its relationship to supporting ideas. Their analysis of text includes exploring how a text makes connections with and distinctions between individuals, ideas, or events. In addition to analyzing the impact of specific word choices on the meaning and tone of a text, students analyze the role of particular sentences in developing and refining key concepts in a paragraph. They also evaluate the advantages and disadvantages of using different media to present a particular topic or text.

Close and critical reading of informational text is essential for students to fully comprehend its content. Students evaluate the arguments and claims made in a text and assess the soundness of the author's reasoning. They also assess the relevance and sufficiency of the evidence provided in a text, recognize irrelevant evidence, and analyze how the author acknowledges and responds to conflicting evidence or viewpoints. Students analyze two or more texts on the same topic but with conflicting information and learn to identify where the disagreements are matters of interpretation or fact. The ability to distinguish differences in facts from differences of interpretation is an important skill that can benefit students throughout their lives.

Writing

Students in eighth grade produce texts that demonstrate increased sophistication in writing skills and use of language—from vocabulary and syntax to a more cohesive organization of ideas addressing increasingly demanding content and sources. Their writing makes use of technology during development, collaboration, and production. Students demonstrate a command of the conventions of the English language as well as experience with strengthening their pieces through revising, editing, or trying new approaches.

Both the 1997 California standards and the CCSS call for students in eighth grade to write multiparagraph texts with a central idea or theme, an identified purpose, a logical organizational structure with relevant supporting details, precise words and visual imagery, and a conclusion. Under the 1997 standards, students write responses to literature, persuasive compositions, research reports, documents related to career development, technical documents, and narratives.

The CCSS writing standards identify three main types of writing applications—arguments, informative/explanatory texts, and narratives—and set challenging expectations for students' writing. For all types of writing, students draw evidence from literary and informational texts to support their analyses, reflections, and research. Students write routinely in both extended and short time frames for a range of discipline-specific tasks, purposes, and audiences. The standards for writing arguments and informative/explanatory texts establish challenging expectations. When writing arguments, students logically organize the reasons and relevant evidence, support claims with logical reasoning, and acknowledge alternate arguments or opposing claims. For informative/explanatory texts, students clearly introduce a topic or thesis and

use an extended array of formatting features, graphics, or multimedia to aid in comprehension. Topics are developed with appropriate facts, details, quotations, and other examples. Both types of text use a formal writing style and provide conclusions supported by the presented information. In their narrative writing, students develop real or imagined events by incorporating description and sensory language to:

- add detail and engage the reader;
- include well-structured events so the sequence unfolds naturally; and
- use transition words and phrases to signal shifting from one time frame to another.

Narrative techniques, such as dialogue, description, and reflection, are incorporated to develop characters and plot.

Technology, including the Internet, plays a larger role in the CCSS. Students use technology to produce and publish their writing, to interact and collaborate with others, and to conduct short research projects to answer a specific question. They learn to gather key information and data from multiple print and digital sources, assess the accuracy and credibility of each source, and effectively incorporate quotations, paraphrasing, or citations (while avoiding plagiarism) in their writing.

Speaking and Listening

Students in eighth grade listen critically to speakers for comprehension; identify and analyze information from a variety of media and formats; engage in collaborative discussions; and deliver arguments, narratives, and summary presentations. In their oral presentations, students include multimedia components and visual displays for clarification and emphasis, use appropriate eye contact and volume, and apply the same conventions of standard English when speaking as in writing.

Both the 1997 California standards and the CCSS focus on students' listening and comprehension skills and formal oral presentation skills. In the CCSS, students analyze the purpose of presented information and evaluate the motives, such as commercial or political, behind the presentation. They also evaluate the reasoning, relevance, and sufficiency of evidence, noting when irrelevant evidence is provided. When students present arguments, narratives, or summaries, they sequence and emphasize points in a focused manner and use pertinent details and examples.

The CCSS emphasize collaborative discussions on eighth-grade topics and texts with diverse partners and in different groupings (one-on-one, in groups, or teacher-led). In these discussions, students build on others' ideas and clearly express their own. They come prepared to add to the discussion, explicitly drawing on research material under study and reflecting on ideas being discussed. Students follow rules for collegial discussions and decision making with specific goals and deadlines and are assigned individual roles. They contribute comments to the discussion and elaborate on the remarks of others, pose questions to connect the ideas of others, and, if warranted, justify their own views based on new evidence presented.

Multimedia components, as sources of information and complements to oral presentations, are another focus of the CCSS. Students in eighth grade analyze the motives behind information presented in diverse media and formats (e.g., visual, quantitative, oral). They use multimedia components and visual displays to clarify claims and emphasize key points in their presentations. Students learn to adapt their speech to a variety of contexts and tasks and are able to use formal English when it is appropriate.

Language

Students in eighth grade are introduced to new rules for grammar usage and punctuation as they continue to build on language skills introduced in earlier grades. The specific rules or conventions they learn vary between the 1997 California standards and the CCSS. Students use their knowledge of language and its conventions when writing, speaking, listening, and reading.

Under the CCSS, students explain the function of gerunds, participles, and infinitives and how they function in particular sentences. Students expand their grammatical knowledge as they learn to form and use verbs in the active and passive voice and apply this knowledge as they recognize and correct inappropriate shifts in verb voice and mood. Students learn to express their ideas more succinctly as they use verbs in the conditional, indicative, imperative, interrogative, or subjunctive mood to achieve particular effects in their writing.

The standards for vocabulary cover a range of strategies students use to determine the meaning of words. For example, the CCSS call for students to use context and a word's position or function in a sentence as a clue to determine the meaning of a word or phrase. In addition, students learn to verify their preliminary determination of the meaning of a word or phrase by checking the meaning in context or in a dictionary. Students learn to understand figurative language, word relationships, and nuances in words by distinguishing among the connotations (associations) of words with similar denotations (definition) (e.g. *bullheaded, willful, firm, persistent, resolute*).

The CCSS also stress using relationships between certain words (e.g., synonym/antonym, analogy) to better understand words. Students continue to use common Greek or Latin affixes and roots as clues for word meanings. Students use both print and digital sources and general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), to pronounce words, clarify the precise meaning or its parts of speech, or trace the etymology of words.

Standards for Literacy in History/Social Studies, Science, and Technical Subjects

Unique to the CCSS in grades six through twelve is the addition of standards for literacy in history/social studies, science, and technical subjects. (In kindergarten through grade five, the standards for literacy are embedded in the four strands of the standards.) The addition of these standards for literacy recognizes the role of English language arts teachers in developing students' literacy skills while clarifying that teachers in other content areas also share that responsibility. The standards for literacy recognize the need for students to be proficient in reading complex informational text and writing persuasive and explanatory text in a specific discipline.

The addition of these standards for literacy recognizes the role of English language arts teachers in developing students' literacy skills while clarifying that teachers in other content areas also share that responsibility.

In the CCSS, the standards for literacy in history/social studies, science, and technical subjects focus on reading and writing and are divided into three parts—reading standards for literacy in history/social studies; reading standards for literacy in science and technical subjects; and writing standards for literacy in history/social studies, science, and technical subjects. Standards in each part are organized into grade spans (six through eight, nine and ten, and eleven and twelve) and follow the same set of anchor standards used in English language arts.

The shared responsibility of developing reading and writing across all content areas is not a new topic of discussion. Over the past 15 years, California's content standards and frameworks have advocated this idea of teachers sharing the responsibility to develop student literacy. For example, guiding principles from the *Science Framework for California Public Schools* (California Department of Education 2004) identify what effective science programs do: (1) use standards-based connections with other core subjects to reinforce science teaching and learning; (2) develop students' command of academic language; and (3) use technology to teach students, assess their knowledge, develop information resources, and enhance computer literacy. California's history–

social science standards include historical and social science analysis skills. Examples of the skills from grades six through are as follows: (1) students frame questions that can be answered by historical study and research; (2) students distinguish fact from opinion in historical narratives and stories; and (3) students understand and distinguish cause, effect, sequence, and correlation in historical events, including the long- and short-term causal relations.

These same skills are identified in the CCSS reading standards in history/social studies and science and technical subjects. The CCSS require the use of specific textual evidence to support analysis of text and to compare and contrast information from different sources (i.e., primary versus secondary sources or doing an experiment versus reading about it). The CCSS highlight the importance of determining the meaning of content-related or domain-specific words as used in a specific historical or scientific context.

As noted in the English language arts section above, the writing standards in the CCSS for literacy expand the types of writing beyond the 1997 California standards. Students are expected to write arguments based on content in a specific discipline, supporting the topic with relevant and accurate evidence. Informative or explanatory text may include writing about a scientific procedure or retelling an historical event. All students' writing should be well organized and developed using key facts or details. Students are expected to conduct research projects to answer a specific question, paraphrase or summarize others' work without plagiarizing, and write consistently within both short and extended time frames.

Extra Support for Struggling Readers

By the end of eighth grade, students are expected to be fluent and independent readers who engage in the analysis of literature and informational text. Students who are not proficient in word-analysis skills are likely to experience academic difficulties. Early screening and intervention address specific areas of instruction in a timely manner. Struggling readers—any students experiencing difficulty learning to read, which may include those who use nonstandard English, English learners, and students with disabilities—should be provided with additional support to become proficient in eighth-grade reading skills. Instructional support for students should include:

Students who are not proficient in word-analysis skills are likely to experience academic difficulties.

- flexible groupings for differentiated instruction;
- opportunities to preteach key skills, strategies, and concepts;
- intensive, explicit instruction in decoding and word-recognition skills, which may include materials at the reading level of students and that are age-appropriate;
- preteaching and reteaching the use of Greek and Latin affixes and roots as clues to determine meaning of unknown words;
- preteaching and reteaching word-learning strategies such as using a word's position or function as clues to determine meaning of unknown words;
- additional direct, explicit instruction in using informational text to analyze overall text structure and features;

- additional direct, explicit direct instruction in using information text to cite evidence as required in text analysis;

- direct, explicit instruction in language development to address grammatical structures of oral and written standard English;

- vocabulary instruction embedded in context, including academic language and domain-specific vocabulary;

- reinforcement and extension of the regular classroom program.

For those students whose reading achievement is two or more years below grade level, placement in an intensive intervention program in reading/language arts should be considered. These stand-alone, accelerated programs are specifically designed to address the instructional needs of students in grades four through eight whose reading achievement is two or more years below grade level. (For additional information on state-adopted intensive intervention programs, see Chapter 9 of the *Reading/Language Arts Framework for California Public Schools* [California Department of Education 2007b] and the list of adopted instructional materials on the CDE Reading/Language Arts Web page at http://www.cde.ca.gov/ci/rl/im/rlaadoptedlist.asp (accessed February 24, 2012).

Support for English Learners

English-language development (ELD) is a critical component of the language arts program for English learners. The CCSS set rigorous expectations for student learning, and ELD instruction must accommodate these enhanced expectations.

Careful placement of English learners in appropriate classes is of utmost consideration. Students in eighth grade need to be assessed to determine the appropriate program placement whether it be an ELD class, an English language arts mainstream class, specially designed academic instruction in English, or a combination of classes. Research by Dutro and Kinsella (California Department of Education 2010b) contends that students at the more advanced levels, such as the intermediate and early advanced levels, benefit from instruction that develops complex language structures, sophisticated vocabulary, and reading comprehension, as well as explicit guided writing instruction to strengthen students' writing abilities.

English learners develop oral and written language through ELD instruction that addresses ELD standards; emphasizes structured, engaging, and purposeful oral language development; focuses on vocabulary development (including academic vocabulary); and targets knowledge of grammatical structures and patterns taught through a structured scope and sequence. Effective ELD instruction also integrates reading and writing applications to build reading comprehension.

Of equal importance is placement (or misplacement) of English learners in reading intervention classes. The aim of reading intervention classes is to support the development of basic knowledge and skills of decoding multisyllabic words, reading fluency, vocabulary-learning strategies, and comprehension strategies, not developing oral language proficiency. In *Improving Education for English Learners: Research-Based Approaches* (California Department of Education 2010b), August and Shanahan suggest the placement of English learners be carefully considered as placement in reading intervention classes alone will not provide the language development offered in structured and focused ELD classes that address ELD standards.

Students in eighth grade are expected to conduct deep analysis of literature and informational text on grade-level topics in all subject areas. English learners benefit from differentiated instruction as they learn how to analyze the structure of informational text and how text features contribute to the development of the ideas in

text. With guided instruction, students will also learn how to cite textual evidence that most strongly supports their statements and inferences in their analysis of text.

When provided with differentiated instruction using informational text, English learners can practice using academic language as well as domain-specific words in different content areas. English learners will benefit from additional explicit instruction on how to determine the meaning of words and phrases, including words that have figurative, connotative, and technical meanings. As English learners participate and engage in collaborative discussions, they are given ample opportunities to hear and practice using vocabulary acquired from their reading. Students learn to pose questions that connect the ideas of others and to respond with relevant evidence, observations, and ideas as they express themselves during one-on-one, small group, or teacher-led discussions.

As English learners participate and engage in collaborative discussions, they are given ample opportunities to hear and practice using vocabulary acquired from their reading.

The CCSS emphasize writing arguments, and English learners will benefit from explicit guided instruction on understanding the structure of argumentative writing. Additional instruction in how to acknowledge and distinguish opposing claims, use credible sources, and establish and maintain a formal style of writing will ensure adequate mastery of those skills. Scaffolds such as sentence and paragraph frames for writing informative and explanatory texts will enable English learners in the early stages of learning English to improve their writing. Guided instruction on developing a thesis statement, organizing ideas, and including well-chosen facts, concrete details, quotations, and a conclusion reinforces valuable skills. Because English learners are still developing proficiency in English, they benefit from receiving positive corrective teacher feedback on writing and grammatical errors. English learners may need additional time and practice in writing for a variety of purposes and audiences to further their writing abilities.

English learners develop oral and written language through formal linguistic instruction that includes learning common phrases, idiomatic expressions, and language patterns, as well as phonological, morphological, syntactical, and semantic structures of English.

Explicit instruction on the rules of grammar and functions of gerunds, participles, and infinitives in particular sentences will help English learners to enhance their writing skills. Additional modeling and guided practice in forming and using verbs in the indicative, imperative, interrogative, conditional, and subjunctive moods will assist English learners in becoming more proficient speakers and writers. Students are provided with multiple opportunities to practice these skills both in speaking and writing and receive corrective teacher feedback.

For those students whose academic achievement is two or more years below grade level, placement in an intensive intervention program for English learners should be considered. These stand-alone, accelerated programs are designed for English learners in grades four through eight whose academic achievement is two or more years below grade level. (For additional information on state-adopted intensive intervention programs for English learners, see Chapter 9 of the *Reading/Language Arts Framework for California Public Schools* [California Department of Education 2007b] and the list of adopted instructional materials on the CDE Reading/Language Arts Web page at http://www.cde.ca.gov/ci/rl/im/rlaadoptedlist.asp (accessed February 24, 2012).

Specially designed academic instruction in English (SDAIE) is one instructional strategy to meet the needs of English learners. For additional resources to support the teaching of English learners, please visit the CDE English Learners Web page at http://www.cde.ca.gov/sp/el/ (accessed February 29, 2012). The CDE has published an excellent resource, *Improving Education for English Learners: Research-Based Approaches* (2010b), with the most comprehensive and up-to-date strategies to serve English learners. Guidelines for using ELD and SDAIE strategies, as well as recommended instructional practices, are provided. Information on the publication is available through the CDE Press Web page at http://www.cde.ca.gov/re/pn/rc/ (accessed February 24, 2012).

English learners need additional time and appropriate instructional support. The CDE publication *A Look at Kindergarten Through Grade Six in California Public Schools: Transitioning to the Common Core State Standards in English Language Arts and Mathematics* (2011c) provides charts for planning ELD instruction for grades kindergarten through grade six. The charts illustrate the enhancements in the CCSS for English language arts that may affect ELD instruction. The CCSS set rigorous expectations for student learning, which has created growing gaps of articulation with the current English-Language Development Standards adopted in 1999. These gaps grow larger with each grade level. By grade eight, the necessary enhancements are more extensive. A chart of the gaps would be less than useful to educators; therefore, it has not been included in this document.

Recent legislation requires the updating of the English Language Development Standards to provide English learners with clearer pathways to the CCSS for English language arts. This process is expected to be completed in the fall of 2012. For more information, visit the CDE Web page at http://www.cde.ca.gov/sp/el/er/ (accessed February 29, 2012.

The Standards

The CCSS, with California additions, that follow are the prepublication version of the standards prepared by the Sacramento County Office of Education (SCOE), updated on October 15, 2010. Content that is unique to California and was added by California to the multistate common core standards is in **bold typeface and underlined**. The SCOE document is available online at http://www.scoe.net/castandards/agenda/2010/ela_ccs_recommendations.pdf [Outside Source] (accessed February 29, 2012). The grade-eight CCSS for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects were adopted by the California State Board of Education on August 2, 2010. The CCSS College and Career Readiness (CCR) Anchor Standards (Appendix A) define the literacy expectations for students entering college and careers and provide the foundation of the K–12 English language arts standards. Although the CCR Anchor Standards were not part of the State Board of Education action in August, they are essential to understanding the structure and cohesive nature of the CCSS.

A complete list of the 1997 California English language arts standards for grade eight is located on the CDE Content Standards Web page at http://www.cde.ca.gov/be/st/ss/documents/elacontentstnds.pdf (accessed February 29, 2012).

Common Core State Standards with California Additions English Language Arts: Grade Eight	
Reading Standards for Literature	
Key Ideas and Details	
1.	Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
2.	Determine a theme or central idea of a text and analyze its development over the course of the text, including its relationship to the characters, setting, and plot; provide an objective summary of the text.

3.	Analyze how particular lines of dialogue or incidents in a story or drama propel the action, reveal aspects of a character, or provoke a decision.
Craft and Structure	
4.	Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts. **(See grade 8 Language standards 4-6 for additional expectations.)**
5.	Compare and contrast the structure of two or more texts and analyze how the differing structure of each text contributes to its meaning and style.
6.	Analyze how differences in the points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) create such effects as suspense or humor.
Integration of Knowledge and Ideas	
7.	Analyze the extent to which a filmed or live production of a story or drama stays faithful to or departs from the text or script, evaluating the choices made by the director or actors.
8.	(Not applicable to literature)
9.	Analyze how a modern work of fiction draws on themes, patterns of events, or character types from myths, traditional stories, or religious works such as the Bible, including describing how the material is rendered new.
Range of Reading and Level of Text Complexity	
10.	By the end of the year, read and comprehend literature, including stories, dramas, and poems, at the high end of grades 6–8 text complexity band independently and proficiently.
Reading Standards for Informational Text	
Key Ideas and Details	
1.	Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
2.	Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.
3.	Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).
Craft and Structure	
4.	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone,

	including analogies or allusions to other texts. **(See grade 8 Language standards 4-6 for additional expectations.)**
5.	Analyze in detail the structure of a specific paragraph in a text, including the role of particular sentences in developing and refining a key concept. **a. Analyze the use of text features (e.g., graphics, headers, captions) in consumer materials.**
6.	Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.
Integration of Knowledge and Ideas	
7.	Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.
8.	Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.
9.	Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation.
Range of Reading and Level of Text Complexity	
10.	By the end of the year, read and comprehend literary nonfiction at the high end of the grades 6–8 text complexity band independently and proficiently.
Writing Standards	
Text Types and Purposes	
1.	Write arguments to support claims with clear reasons and relevant evidence. a. Introduce claim(s), acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. b. Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. d. Establish and maintain a formal style. e. Provide a concluding statement or section that follows from and supports the argument presented.

2.	Write informative/explanatory texts, **including career development documents (e.g., simple business letters and job applications)**, to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. a. Introduce a topic **or thesis statement** clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Establish and maintain a formal style. f. Provide a concluding statement or section that follows from and supports the information or explanation presented.
3.	Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences. a. Engage and orient the reader by establishing a context and point of view and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically. b. Use narrative techniques, such as dialogue, pacing, description, and reflection, to develop experiences, events, and/or characters. c. Use a variety of transition words, phrases, and clauses to convey sequence, signal shifts from one time frame or setting to another, and show the relationships among experiences and events. d. Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events. e. Provide a conclusion that follows from and reflects on the narrated experiences or events.
Production and Distribution of Writing	
4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
5.	With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and

	audience have been addressed. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 8.)
6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.
Research to Build and Present Knowledge	
7.	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
8.	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
9.	Draw evidence from literary or informational texts to support analysis, reflection, and research. a. Apply grade 8 Reading standards to literature (e.g., "Analyze how a modern work of fiction draws on themes, patterns of events, or character types from myths, traditional stories, or religious works such as the Bible, including describing how the material is rendered new"). b. Apply grade 8 Reading standards to literary nonfiction (e.g., "Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced").
Range of Writing	
10.	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
Speaking and Listening Standards	
Comprehension and Collaboration	
1.	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 8 topics, texts, and issues,* building on others' ideas and expressing their own clearly. a. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion. b. Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

	c. Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas. d. Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.
2.	Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.
3.	Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.
Presentation of Knowledge and Ideas	
4.	Present claims and findings **(e.g., argument, narrative, response to literature presentations)**, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation. **a. Plan and present a narrative that: establishes a context and point of view, presents a logical sequence, uses narrative techniques (e.g., dialogue, pacing, description, sensory language), uses a variety of transitions, and provides a conclusion that reflects the experience.**
5.	Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.
6.	Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 8 Language standards 1 and 3 for specific expectations.)
Language Standards	
Conventions of Standard English	
1.	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. a. Explain the function of verbals (gerunds, participles, infinitives) in general and their function in particular sentences. b. Form and use verbs in the active and passive voice. c. Form and use verbs in the indicative, imperative, interrogative, conditional, and subjunctive mood.

	d. Recognize and correct inappropriate shifts in verb voice and mood.*
2.	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. a. Use punctuation (comma, ellipsis, dash) to indicate a pause or break. b. Use an ellipsis to indicate an omission. c. Spell correctly.
Knowledge of Language	
3.	Use knowledge of language and its conventions when writing, speaking, reading, or listening. a. Use verbs in the active and passive voice and in the conditional and subjunctive mood to achieve particular effects (e.g., emphasizing the actor or the action; expressing uncertainty or describing a state contrary to fact).
Vocabulary Acquisition and Use	
4.	Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on *grade 8 reading and content*, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., *precede, recede, secede*). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech **or trace the etymology of words**. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
5.	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. a. Interpret figures of speech (e.g. verbal irony, puns) in context. b. Use the relationship between particular words to better understand each of the words.

* The following skills are particularly likely to require continued attention in higher grades as they are applied to increasingly sophisticated writing and speaking. See "Language Progress Chart, By Grade" in the CCSS.

	c. Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., *bullheaded, willful, firm, persistent, resolute*).
6.	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Common Core State Standards with California Additions
Reading Standards for Literacy in History/Social Studies, Science, and Technical Subjects
Grades Six Through Eight

Reading Standards for Literacy in History/Social Studies

Key Ideas and Details	
1.	Cite specific textual evidence to support analysis of primary and secondary sources.
2.	Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.
3.	Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).
Craft and Structure	
4.	Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.
5.	Describe how a text presents information (e.g., sequentially, comparatively, causally).
6.	Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).
Integration of Knowledge and Ideas	
7.	Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.
8.	Distinguish among fact, opinion, and reasoned judgment in a text.
9.	Analyze the relationship between a primary and secondary source on the same topic.

Range of Reading and Level of Text Complexity	
10.	By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.
Reading Standards for Literacy in Science and Technical Subjects	
Key Ideas and Details	
1.	Cite specific textual evidence to support analysis of science and technical texts.
2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
Craft and Structure	
4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6–8 texts and topics*.
5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
6.	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.
Integration of Knowledge and Ideas	
7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
8.	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
Range of Reading and Level of Text Complexity	
10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.
Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects	
Text Types and Purposes	
1.	Write arguments focused on *discipline-specific content*.

	a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources. c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. d. Establish and maintain a formal style. e. Provide a concluding statement or section that follows from and supports the argument presented.
2.	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. b. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Establish and maintain a formal style and objective tone. f. Provide a concluding statement or section that follows from and supports the information or explanation presented.
3.	(See note; not applicable as a separate requirement)[*]
Production and Distribution of Writing	
4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5.	With some guidance and support from peers and adults, develop and strengthen writing as needed

[*] **Note**: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historical import. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.

	by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.
6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.
Research to Build and Present Knowledge	
7.	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
8.	Gather relevant information from multiple print and digital sources **(primary and secondary)**, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
9.	Draw evidence from informational texts to support analysis reflection, and research.
Range of Writing	
10.	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

California additions are in **bold typeface and underlined**.

Mathematics

Overview

Effective mathematics education provides students with a balanced instructional program. In such a program, students become proficient in basic computational skills and procedures, develop conceptual understandings, and become adept at problem solving. Standards-based mathematics instruction starts with foundational mathematics ideas and increases in scope and content as the years progress. It is like an inverted pyramid, with the entire weight of the developing subject, including readiness for algebra, resting on the foundations built in the early grades.

In August 2010, California adopted new standards in mathematics, the Common Core State Standards (CCSS), with California additions. When adopting the CCSS, the California State Board of Education (SBE) accepted the CCSS for grade-eight students yet recognized that many eighth-grade students are ready for Algebra I. Consequently, the SBE adopted two sets of standards for eighth grade. One set of standards is the CCSS.[1] The goal of the eighth-grade CCSS is to prepare students for higher mathematics, whether they take a traditional sequence or an integrated sequence. This transition document will focus on the CCSS for eighth grade.

The other set describes standards for Grade Eight Algebra I (Appendix C). These Grade Eight Algebra I standards include some 1997 California Algebra I standards, all of the eighth-grade CCSS, and some CCSS from the high school conceptual categories of Number and Quantity, Algebra, Functions, and Geometry. For students who are prepared to take Algebra I in eighth grade, a course based on this set of standards would be appropriate, as would Algebra I courses currently provided by a school district or one based on the CCSS high school standards. (For more information about the CCSS Mathematics Standards for High School, see Appendix A of the Common Core State Standards Initiative Web page at http://www.corestandards.org/assets/CCSSI_Mathematics_Appendix_A.pdf. [Outside Source] (accessed February 29, 2012).

The new standards will be implemented gradually over the next several years as curriculum frameworks, instructional materials, and assessments based on the CCSS are adopted. There are some differences between the 1997 California mathematics standards and the CCSS for mathematics that are worth noting. For instance, the CCSS include standards for mathematical practice, which apply to all grade levels, as well as content standards for each grade level. The standards for mathematical practice will be discussed in more detail in the next section and are also included in Appendix B of this document.

Another notable difference is that the CCSS include an eighth-grade course. Unlike the 1997 California mathematics standards, the CCSS are organized by "domains" that add grade-level focus and vary by grade level. The domains for eighth grade are Number System, Expressions and Equations, Functions, Geometry, and Probability and Statistics. In addition, the CCSS do not include "key standards." Instead, the CCSS are designed to be more focused at each grade level and develop mathematics topics in greater depth. The CCSS provide a means of continuing a student's preparation for higher mathematics.

This section provides an overview of the CCSS for eighth-grade mathematics. It also includes guidance on areas of mathematics that may be challenging for some English learners. A complete list of the CCSS for

1. These eighth-grade standards are the standards for which the SMARTER Balanced Assessment Consortium is developing summative assessments for eighth-grade students.

eighth-grade mathematics can be found at the end of this section. (For a complete list of the Grade Eight Algebra I standards, see Appendix C at the end of this document.) A complete list of the Algebra I 1997 California mathematics standards is located on the CDE Content Standards Web page at http://www.cde.ca.gov/be/st/ss/documents/mathstandards.pdf (accessed February 29, 2012).

What Students Learn in Eighth Grade

Standards for Mathematical Practice

There are two types of mathematical standards: the standards for mathematical practice, which are the same from kindergarten through grade twelve, and the standards for mathematical content, which are different for each grade level. The mathematical practice standards describe what mathematics educators at all levels should develop in their students. The mathematical practice standards support essential "processes and proficiencies" that deepen students' conceptual understanding of mathematics. Doing and using mathematics involves connecting mathematical content and practices. Mathematical content standards that call for students to "understand" or "explain" are potential points of intersection between the standards for mathematical content and the standards for mathematical practice.

The mathematical practice standards support essential "processes and proficiencies" that deepen students' conceptual understanding of mathematics.

The following chart provides a general overview of the standards for mathematical practice. For a more detailed explanation of each standard, see Appendix B.

Standards for Mathematical Practice	Summary
1. Make sense of problems and persevere in solving them	• Find meaning in problems. • Analyze, predict, and plan solution pathways. • Verify answers. • Students ask themselves the question: "Does this make sense?"
2. Reason abstractly and quantitatively	• Make sense of quantities and their relationships in problems. • Create coherent representations of problems.
3. Construct viable arguments and critique the reasoning of others	• Understand and use information to construct arguments. • Make and explore the truth of conjectures. • Justify conclusions and respond to arguments of others.
4. Model with mathematics	• Apply mathematics to problems in everyday life. • Identify quantities in a practical situation. • Interpret results in the context of the situation and reflect on whether the results make sense.
5. Use appropriate tools strategically	• Consider the available tools when solving problems. • Are familiar with tools appropriate for their grade or course (pencil and paper, concrete models, ruler, protractor, calculator, spreadsheet, computer programs, digital content located on a Web site, and other technological tools).

6. Be precise	• Communicate precisely to others. • Use clear definitions, state the meaning of symbols, and are careful about specifying units of measure and labeling axes. • Calculate accurately and efficiently.
7. Look for and make use of structure	• Discern patterns and structures. • Can step back for an overview and shift perspective. • See complicated things as single objects or as being composed of several objects.
8. Look for and identify ways to create shortcuts when doing problems	• When calculations are repeated, look for general methods, patterns, and shortcuts. • Be able to evaluate whether an answer makes sense.

Source: Adapted from the *Common Core Standards Parent Handbook* (California County Superintendents Educational Services Association 2011).

Standards for Mathematical Content

Eighth-grade students build on their understanding of proportional relationships and solve related real-world and mathematical problems. They apply this understanding to graphing and solving linear equations and systems of linear equations. Students comprehend the concept of a function and use functions to describe quantitative relationships. They describe and analyze two- and three-dimensional figures using their knowledge of distance, angles, similarity, and congruence. Eighth-grade students understand and apply the Pythagorean theorem. They work with irrational numbers, representing them with radical expressions and approximating them with rational numbers. Students' work with line plots in earlier grades progresses into the graphing of bivariate measurement data with scatter plots in eighth grade. Students construct and interpret scatter plots to discover associations between measured variables.

A small number of eighth-grade standards are first introduced in seventh grade as part of the California additions to the seventh-grade standards[2]. The focus and coherence of instruction and learning in eighth grade is maintained by revisiting these standards and connecting them to the other eighth-grade standards.

The Number System

In eighth grade, students work with irrational numbers. They informally understand that every number has a decimal expansion. For rational numbers, students show that the decimal expansion repeats eventually and convert these types of decimals into rational numbers. Students learn that numbers that are not rational are called *irrational numbers*.

Students also learn that irrational numbers can be approximated by rational numbers. They use rational approximations to compare the size of irrational numbers, locate them on a number line, and estimate the value of expressions with irrational numbers. Students are familiar with the approximation for the irrational number *pi* that they used to determine the area or circumference of a circle in seventh grade. They will work with irrational numbers and their rational approximations when solving equations such as $x^2 = 2$ and problems involving the Pythagorean theorem.

2. The following eighth-grade standards are first introduced in seventh grade: 8NS-1, 8NS-2, 8EE-2, 8EE-3, and 8G-9.

Expressions and Equations

The expressions and equations domain is a critical area of instruction and learning in eighth grade. Students build on their previous experiences with exponents. They apply the properties of integer exponents to generate equivalent numerical expressions. They gain experience with the properties of exponents by working with powers of 10, in the form of single-digit numbers times an integer power of 10 (e.g., 6×10^8), to estimate very large or very small quantities. They also perform operations with very large or very small numbers expressed in scientific notation. As students work with scientific notation, they learn to choose units of appropriate size for measurement of very large or very small quantities. They also learn to interpret scientific notation that has been generated by technology.

In eighth grade, students begin to work systematically with square root and cube root symbols. They use these symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. They evaluate square roots of small perfect squares (e.g., $\sqrt{16} = 4$) and small perfect cubes (e.g., $\sqrt[3]{27} = 3$). Students make connections between their understanding of irrational numbers and radicals as they recognize that $\sqrt{2}$ is an irrational number.

Students also make the important connection between proportional relationships, lines, and linear equations. As students graph proportional relationships on a coordinate plane, they create a visual representation of the relationship between two quantities. They interpret the unit rate in a proportional relationship (e.g., r miles per hour) as the slope of the graph. They understand that the slope of a line represents a constant rate of change. Students compare two different proportional relationships presented in different ways (e.g., as graph of the line through the origin, a table exhibiting a constant rate of change, or an equation of the form $y = kx$).

Students use similar triangles to explain why the slope m is the same between any two distinct points on a nonvertical line in the coordinate plane. Students derive the equations $y = mx$ (for a line through the origin) and $y = mx + b$ (for a line intercepting the vertical axis at b) from the fact that the slope is constant between any two points on a line.

Much of students' work in eighth grade involves analyzing and solving linear equations and pairs of simultaneous linear equations. They solve linear equations with one variable, including cases with one solution, infinitely many solutions, and no solutions. Students show examples of each of these cases by successively transforming an equation into simpler forms ($x = a$, $a = a$, and $a = b$, where a and b represent different numbers). Solving some linear equations will require students to expand expressions using the distributive property and to collect like terms.

Solving pairs of simultaneous linear equations builds on the skills and understandings students used to solve linear equations with one variable. An underlying concept that students grasp as they work with simultaneous linear equations is the understanding that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because the points of intersection satisfy both equations simultaneously. Students algebraically solve systems of two linear equations in two variables. They also estimate solutions by graphing the equations, which results in pairs of lines that intersect, are parallel, or are the same line. In some simple cases, students can solve the pairs of linear equations by inspection and reasoning. For example, $4x + 7y = 28$ and $4x + 7y = 32$ have no solution, because $4x + 7y$ cannot simultaneously be 28 and 32. Students also solve real-world and mathematical problems leading to two linear equations in two variables. As students gain experience with solving pairs of simultaneous linear equations, they are able to solve a greater variety of real-world problems.

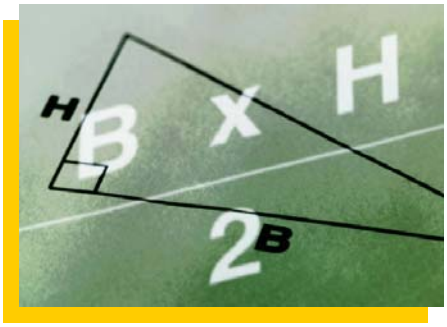
Functions

Another important area of instruction in eighth grade is the functions domain. As a starting point for working with functions, students understand the concept of a function as a rule that assigns to each input exactly one output and that functions describe situations in which one quantity determines another. Students may connect these foundational understandings about functions to their work with proportional relationships. The same kinds of tables and graphs students used in seventh grade to recognize and represent proportional relationships between quantities are used in eighth grade when students compare the properties of two functions that are represented in different ways (e.g., numerically in tables, visually in graphs). Students also compare the properties of two functions that are represented algebraically or verbally.

Students' understanding of the equation $y = mx + b$ deepens as they learn that the equation defines a linear function whose graph is a straight line. To avoid the mistaken impression that all functional relationships are linear, students also work with nonlinear functions and provide examples of nonlinear functions. They recognize that the graph of a nonlinear function is not a straight line. One example of a nonlinear function is the function $A = s^2$ (the area of a square as a function of the length of its side), the graph of which contains the points (1, 1), (2, 4), and (3, 9) and does not result in a straight line.

Students use functions to model relationships between quantities. They construct functions to model a linear relationship between two quantities. Students determine and interpret the rate of change and initial value of the function from the two (x, y) values or a description of a relationship. Students analyze graphs and then describe qualitatively the functional relationship between two quantities (e.g., where the function is increasing or decreasing, linear or nonlinear). They are able to sketch graphs that illustrate the qualitative features of functions that are described verbally.

Geometry



Students analyze two- and three-dimensional space and figures by using ideas about distance, angle, similarity, and congruence and by understanding and applying the Pythagorean theorem. They will learn the formulas for calculating the volumes of cones, cylinders, and spheres and use the formulas to solve real-world and mathematical problems. At the end of eighth grade, students will have developed a range of geometric measurement skills and an understanding of the Pythagorean theorem that will support their work in high school-level geometry.

With the aid of physical models, transparencies, and geometry software, students gain an understanding of congruence and similarity. Through experimentation, students verify the properties of rotations, reflections, and translations, including discovering that these transformations change the position of a geometric figure but not its shape or size. Students can also describe the effect of dilations (which change the size but not the shape of the figure), translations, rotations, and reflections on two-dimensional figures using coordinates on a graph. They understand that two-dimensional figures are considered *congruent* if one figure can be obtained from the other by a sequence of rotations, reflections, and translations and that the figures are considered *similar* if one figure can be obtained from the other by a sequence of dilations, rotations, reflections, and translations. Students can also describe a sequence that shows the congruence or similarity between the two figures. They use informal arguments to establish facts about the angle sum and exterior angles of triangles (e.g., consecutive exterior angles are supplementary), the angles created when parallel lines are cut by a transversal (e.g., the corresponding angles are congruent), and the angle–angle criterion for similarity of triangles (if two angles of a triangle are congruent to two angles of another triangle, the two triangles are similar).

The CCSS call for students to be formally introduced to the Pythagorean theorem in eighth grade. Under the 1997 California standards this topic is covered in seventh grade but in less depth than in the eighth-grade CCSS. Students explain a proof of the Pythagorean theorem and its converse. They apply the Pythagorean theorem to determine the side lengths in right triangles in real-world and mathematical problems in both two and three dimensions. For example, students can determine the length of the hypotenuse of a right triangle if they know the length of the two other sides. They can also use the Pythagorean theorem to find the distance between two points in a coordinate system.

Statistics and Probability

Building on work in earlier grades with univariate measurement data and analyzing data on line plots and histograms, eighth-grade students begin to work with bivariate measurement data and use scatter plots to represent and analyze the data. Bivariate measurement data consist of data that represent two measurements. Scatter plots can show the relationship between the two measured variables. Collecting and analyzing bivariate measurement data help students to answer questions such as how does more time spent on homework affect test grades and what is the relationship between years of education and annual income.

Students construct and interpret scatter plots to investigate patterns of association between two quantities. They describe patterns they see on the scatter plots, such as clustering, outliers, positive or negative association, and linear or nonlinear association. Students know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that appear to show a linear association, students informally fit a straight line (e.g., by drawing a line on the coordinate plane between data points) and informally assess the fit by judging the closeness of the data points to the straight line.

Students solve problems in the context of bivariate measurement data by using the equation of a linear model. They interpret the slope and the intercept. For example, in a linear model for a biology experiment, students interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in the height of the plant.

Students learn to see patterns of association in bivariate categorical data in a two-way table. They construct and interpret a two-way table that summarizes data on two categorical variables collected from the same subjects. The two-way table displays frequencies and relative frequencies. Students use relative frequencies calculated from rows or columns to describe possible association between the two variables. For example, students collect data from their classmates about whether they have a pet and whether they do chores at home. The two-way table allows students to easily see if students who have a pet also tend to do chores at home.

Support for English Learners

Students need to develop knowledge of mathematics as a language. The linguistic complexity and unfamiliar academic language of mathematics may pose particular challenges for English learners. The language of mathematics has its own precise and discipline-specific meanings. English learners need opportunities to develop their knowledge of the features of language that are used to teach mathematics, such as *semantics* (how to translate the words of a problem into a symbolic representation), and *mathematical discourse* (writing or talking about mathematical terms, concepts, and so on).

The specialized vocabulary of mathematics should be explicitly taught and reinforced throughout the year. *Explain, prove, justify, determine, solve, identify, analyze, compare, estimate, interpret, generate, locate, illustrate, obtain, reproduce,* and *summarize* are examples of verbs that are commonly used in mathematics that may pose challenges for English learners. Specialized vocabulary encountered in mathematics that may require additional explanation includes nouns such as *diagram, scale drawing, derivation, evidence, expression, display, measurement data,* and *rational* and *irrational* numbers. Attention must also be paid to words that have

a different meaning in common discourse than in mathematics—such as *set*, *table, digit*, *plane, space, round, point*, and *field*.

Students are expected to explain and apply concepts they encounter and procedures in solving real-world and mathematical problems. They construct and present well-defined, plausible arguments. Although students may use models, diagrams, or drawings to explain some concepts or present an argument, other problems will require that students produce an oral or written response. English learners can successfully engage in these learning opportunities with teacher guidance and multiple practice opportunities. Teachers should also be aware that students may have learned different symbols and procedures that could result in the same answer. In some countries, students are expected to do most steps mentally instead of writing out each step.

English learners may benefit from instructional support such as the following:

- Daily opportunities to engage in mathematical discourse by using new vocabulary and explaining the operations used in problem solving
- Opportunities to listen to or read others' arguments and decide if they are strongly supported
- Use of the students' first language to make instruction in English more effective and the specialized vocabulary of mathematics more comprehensible
- Use of individualized or small-group instruction.
- Scaffolded instruction and models for constructing arguments that include support and justification for their reasoning, responding to the arguments of others, and asking or answering clarifying questions

Instruction in mathematics that develops procedural proficiency, along with conceptual understanding and critical-thinking skills, should be promoted despite low literacy or limited proficiency in the English language. Specially designed academic instruction in English (SDAIE) is one instructional strategy to meet the needs of English learners. For additional resources to support the teaching of English learners, please visit the CDE English Learners Web page at http://www.cde.ca.gov/sp/el/ (accessed February 24, 2012).

Use of Calculators

The use of calculators and other technology plays a special role in mathematics teaching and learning. In eighth grade, students are ready to use calculators, including graphing calculators, geometry software, modeling software, and electronic resources to their advantage. Technology may be a useful tool for solving problems in various contexts, broadening students' mathematical horizons, and visually demonstrating complex mathematical problems. Technology also provides access to Internet sources for data to support solving real-world problems.

The Standards

The CCSS that follow are the prepublication version of the standards prepared by the Sacramento County Office of Education (SCOE), updated on October 18, 2010. The SCOE document is available online at http://www.scoe.net/castandards/agenda/2010/math_ccs_recommendations.pdf [Outside Source] (accssed February 29, 2012). These CCSS for grade-eight mathematics were adopted as presented, with no California

additions, by the California State Board of Education on August 2, 2010. (For a complete list of the Grade Eight Algebra I standards, see Appendix C at the end of this document.)

A complete list of the Algebra I 1997 California mathematics standards is located on the CDE Content Standards Web page at http://www.cde.ca.gov/be/st/ss/documents/mathstandard.pdf (accessed February 29, 2012).

Common Core State Standards Mathematics: Grade Eight	
The Number System (8.NS)	
Know that there are numbers that are not rational, and approximate them by rational numbers.	
1.	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
2.	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). *For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*
Expressions and Equations (8.EE)	
Work with radicals and integer exponents.	
1.	Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.*
2.	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
3.	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.*
4.	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
Understand the connections between proportional relationships, lines, and linear equations.	

5.	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*
6.	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
Analyze and solve linear equations and pairs of simultaneous linear equations.	
7.	Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
8.	Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.* c. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*
Functions (8.F)	
Define, evaluate, and compare functions.	
1.	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.[1]
2.	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

1. Function notation is not required in grade 8.

3.	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*
Use functions to model relationships between quantities.	
4.	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
5.	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
Geometry (8.G)	
Understand congruence and similarity using physical models, transparencies, or geometry software.	
1.	Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure. c. Parallel lines are taken to parallel lines.
2.	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
3.	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
4.	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
5.	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*
Understand and apply the Pythagorean Theorem.	
6.	Explain a proof of the Pythagorean Theorem and its converse.
7.	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

8.	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	
9.	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
Statistics and Probability (8.SP)	
Investigate patterns of association in bivariate data.	
1.	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
2.	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
3.	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*
4.	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*
	Standards for Mathematical Practice 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning. The CCSS for Mathematical Practice describe ways in which students of mathematics ought to engage with the subject matter as they grow in mathematical maturity and expertise. For a complete description of the eight Standards for Mathematical Practice, see Appendix B.

CCSS Domains

The CCSS are organized by domains. The following table lists all of the domains that apply to kindergarten through grade eight, and it identifies which domains are addressed in grades seven and eight. The shaded rows indicate domains covered in earlier grades.

Domains	Grade Seven	Grade Eight
Counting and Cardinality (CC)		
Operations and Algebraic Thinking (OA)		
Numbers and Operations in Base Ten (NBT)		
Measurement and Data		
Number and Operations-Fractions		
Geometry	**X**	**X**
Ratios and Proportional Relationships (RP)	**X**	
The Number System (NS)	**X**	**X**
Expressions and Equations (EE)	**X**	**X**
Statistics and Probability (SP)	**X**	**X**
Functions (F)		**X**

Appendix A: CCSS College and Career Readiness Anchor Standards

The CCSS College and Career Readiness (CCR) Anchor Standards define the literacy expectations for students entering college and careers and provide the foundation of the K–12 English language arts standards. Although the CCR Anchor Standards were not part of the California State Board of Education action in August 2010, they are essential to understanding the structure and cohesive nature of the CCSS.

Reading

Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.
6. Assess how point of view or purpose shapes the content and style of a text.

Integration of Knowledge and Ideas

7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.[1]
8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of Reading and Level of Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.

Writing

Text Types and Purposes[2]

1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

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1. Please see "Research to Build and Present Knowledge" in Writing and "Comprehension and Collaboration" in Speaking and Listening for additional standards relevant to gathering, assessing, and applying information from print and digital sources.
2. These broad types of writing include many subgenres. See Appendix A of the CCSS for definitions of key writing types at http://www.corestandards.org/assets/Appendix_A.pdf [Outside Source] (accessed February 29, 2012).

2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Range of Writing

10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

Speaking and Listening

Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

Presentation of Knowledge and Ideas

4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

Language

Conventions of Standard English

1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Knowledge of Language

3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

Vocabulary Acquisition and Use

4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.
5. Demonstrate understanding of word relationships and nuances in word meanings.
6. Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

Appendix B: Standards for Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. The first of these are the NCTM [National Council of Teachers of Mathematics] process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report *Adding It Up:* adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

1. Make sense of problems and persevere in solving them.
Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

2. Reason abstractly and quantitatively.
Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

3. Construct viable arguments and critique the reasoning of others.
Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others,

and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

4. Model with mathematics.
Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically.
Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

6. Attend to precision.
Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

7. Look for and make use of structure.
Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 – 3(x – y)2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.

8. Look for and express regularity in repeated reasoning.
Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y – 2)/(x – 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x – 1)(x + 1)$, $(x – 1)(x2 + x + 1)$, and $(x – 1)(x3 + x2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

Connecting the Standards for Mathematical Practice to the Standards for Mathematical Content
The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years. Designers of curricula, assessments, and professional development should all attend to the need to connect the mathematical practices to mathematical content in mathematics instruction.

The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word “understand” are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview, or deviate from a known procedure to find a shortcut. In short, a lack of understanding effectively prevents a student from engaging in the mathematical practices.

In this respect, those content standards which set an expectation of understanding are potential “points of intersection” between the Standards for Mathematical Content and the Standards for Mathematical Practice. These points of intersection are intended to be weighted toward central and generative concepts in the school mathematics curriculum that most merit the time, resources, innovative energies, and focus necessary to qualitatively improve the curriculum, instruction, assessment, professional development, and student achievement in mathematics.

Common Core State Standards with California Additions Mathematics: Grade Eight Algebra 1

Number and Quantity

The Real Number System (RN)

Extend the properties of exponents to rational exponents.

1.	**Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.* (Common Core Standard N-RN-1)**
2.	**Rewrite expressions involving radicals and rational exponents using the properties of exponents. (Common Core Standard N-RN-2)**

Use properties of rational and irrational numbers.

3.	**Understand informally that the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational. (Common Core Standard N-RN-3)**

Quantities (Q)

4.	**Define appropriate quantities for the purpose of descriptive modeling. (Common Core Standard N-Q-2)**

Algebra

Expressions and Equations (EE)

Work with radicals and integer exponents.

1.	**Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.* (Common Core Standard 8EE-1)**
2.	**Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology. (Common Core Standard 8EE-4)**

Understand the connections between proportional relationships, lines, and linear equations.

3.	**Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.* (Common Core Standard 8EE-5)**
4.	**Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation *y = mx* for a line through the origin and the equation *y = mx + b* for a line intercepting the vertical axis at *b*. (Common Core Standard 8EE-6)**
Analyze and solve linear equations and pairs of simultaneous linear equations.	
5.	**Solve linear equations in one variable. (Common Core Standard 8EE-7)** **a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form *x = a*, *a = a*, or *a = b* results (where *a* and *b* are different numbers). (Common Core Standard 8EE-7a)** **b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. (Common Core Standard 8EE-7b)**
6.	**Analyze and solve pairs of simultaneous linear equations. (Common Core Standard 8EE-8)** **a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. (Common Core Standard 8EE-8a)** **b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.* (Common Core Standard 8EE-8b)** **c. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.* (Common Core Standard 8EE-8c)**
Seeing Structure in Expressions (SSE)	
Interpret the structure of expressions	
7.	**Interpret expressions that represent a quantity in terms of its context.★ (Common Core Standard A-SSE-1)**

★Modeling is best interpreted not as a collection of isolated topics but in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

	a. Interpret parts of an expression, such as terms, factors, and coefficients. (Common Core Standard A-SSE-1a) **b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret P(1+r)^n as the product of P and a factor not depending on P.* (Common Core Standard A-SSE-1b)**
8.	**Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.* (Common Core Standard A-SSE-2)** **a. Use the distributive property to express a sum of terms with a common factor as a multiple of a sum of terms with no common factor. *For example, express xy2 + x2y as xy (y + x).* (Common Core Standard A-SSE-2a)** **b. Use the properties of operations to express a product of a sum of terms as a sum of products. *For example, use the properties of operations to express (x + 5)(3 - x + c) as -x2 + cx - 2x + 5c + 15.* (Common Core Standard A-SSE-2b)**
Write expressions in equivalent forms to solve problems	
9.	**Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★(Common Core Standard A-SSE-3)** **a. Factor a quadratic expression to reveal the zeros of the function it defines. (Common Core Standard A-SSE-3a)** **b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. (Common Core Standard A-SSE-3b)**
Arithmetic with Polynomials and Rational Expressions (APR)	
Perform arithmetic operations on polynomials	
10.	**Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials, and divide polynomials by monomials. Solve problems in and out of context. (Common Core Standard A-APR-1)**
Creating Equations (CED)	
Create equations that describe numbers or relationships	
11.	**Create equations and inequalities in one variable including ones with absolute value and use them to solve problems in and out of context, including equations arising from linear functions.**
12.	**Create equations in two or more variables to represent relationships between quantities; graph**

	equations on coordinate axes with labels and scales (limit to linear and quadratic). (Common Core Standard A-CED-2)
13.	**Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.* (Common Core Standard A-CED-3)**
14.	**Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.* (Common Core Standard A-CED-4)**
Reasoning with Equations and Inequalities (REI)	
Solve equations and inequalities in one variable	
15.	**Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (Common Core Standard A-REI-3)**
16.	**Solve quadratic equations in one variable. (Common Core Standard A-REI-4)** **a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. (Common Core Standard A-REI-4a)** **b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. (Common Core Standard A-REI-4b)**
Solve systems of equations	
17.	**Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. (Common Core Standard A-REI-6)**
Represent and solve equations and inequalities graphically	
18.	**Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). (Common Core Standard A-REI-10)**
19.	**Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. (Common Core Standard A-REI-12)**

Functions	
Functions (F)	
Define, evaluate, and compare functions.	
1.	**Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.[1] (Common Core Standard 8F-1)**
2.	**Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.* (Common Core Standard 8F-2)**
3.	**Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.* (Common Core Standard 8F-3)**
Use functions to model relationships between quantities.	
4.	**Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. (Common Core Standard 8F-4)**
5.	**Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. (Common Core Standard 8F-5)**
Interpreting Functions (IF)	
Interpret functions that arise in applications in terms of the context	
6.	**For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ (Common Core Standard F-IF-4)**
7.	**Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it***

1. Function notation is not required in Grade 8.

	takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function. ★ **(Common Core Standard F-IF-5)**
Analyze functions using different representations	
8.	**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.** ★ **(Common Core Standard F-IF-7)** **a. Graph linear and quadratic functions and show intercepts, maxima, and minima. (Common Core Standard F-IF-7a)**
9.	**Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (Common Core Standard F-IF-8)** **a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. (Common Core Standard F-IF-8a)**
Building Functions (BF)	
Build a function that models a relationship between two quantities	
10.	**Write a function that describes a relationship between two quantities.** ★ **(Common Core Standard F-BF-1)** **a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (Common Core Standard F-BF-1a)**
Build new functions from existing functions	
11.	**Identify the effect on the graph of replacing *f*(*x*) by *f*(*x*) + *k*, *k f*(*x*), *f*(*kx*), and *f*(*x* + *k*) for specific values of *k* (both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (Common Core Standard F-BF-3)**
Linear, Quadratic, and Exponential Models (LQE)	
Interpret expressions for functions in terms of the situation they model	
12.	**Interpret the parameters in a linear or exponential function in terms of a context. (Common Core Standard F-LE-5)**
13.	**Apply quadratic equations to physical problems, such as the motion of an object under the force of gravity. (CA Standard A-23)**

Geometry	
Geometry (G)	
Understand congruence and similarity using physical models, transparencies, or geometry software.	
1.	**Verify experimentally the properties of rotations, reflections, and translations: (Common Core Standard 8G-1)** **a. Lines are taken to lines, and line segments to line segments of the same length. (Common Core Standard 8G-1a)** **b. Angles are taken to angles of the same measure. (Common Core Standard 8G-1b)** **c. Parallel lines are taken to parallel lines. (Common Core Standard 8G-1c)**
2.	**Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. (Common Core Standard 8G-2)**
3.	**Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. (Common Core Standard 8G-3)**
4.	**Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. (Common Core Standard 8G-4)**
5.	**Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.* (Common Core Standard 8G-5)**
Understand and apply the Pythagorean Theorem.	
6.	**Explain a proof of the Pythagorean Theorem and its converse. (Common Core Standard 8G-6)**
7.	**Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. (Common Core Standard 8G-7)**
8.	**Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. (Common Core Standard 8G-8)**

Expressing Geometric Properties with Equations (GPE)	
Use coordinates to prove simple geometric theorems algebraically	
9.	**Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point). (Common Core Standard G-GPE-5)**
Statistics and Probability	
Statistics and Probability (SP)	
Investigate patterns of association in bivariate data.	
1.	**Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. (Common Core Standard 8SP-1)**
2.	**Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. (Common Core Standard 8SP-2)**
3.	**Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.* (Common Core Standard 8SP-3)**
4.	**Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?* (Common Core Standard 8SP-4)**
Constructing Viable Arguments	
Constructing Viable Arguments (CVA)	
1.	**Use and know simple aspects of a logical argument. (California Algebra I, Standard 24.0)** **a. Use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion. (California Algebra I, Standard 24.3)**

2.	**Use properties of the number system to judge the validity of results, to justify each step of a procedure, and to prove or disprove statements: (California Algebra I, Standard 25.0)** **a. Use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions. (California Algebra I, Standard 25.1)** **b. Judge the validity of an argument according to whether the properties of the real number system and the order of operations have been applied correctly at each step. (California Algebra I, Standard 25.2)** **c. Given a specific algebraic statement involving linear, quadratic, or absolute value expressions or equations or inequalities, determine whether the statement is true sometimes, always, or never. (California Algebra I, Standard 25.3)**
	Standards for Mathematical Practice 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning. The CCSS for Mathematical Practice describe ways in which students of mathematics ought to engage with the subject matter as they grow in mathematical maturity and expertise. For a complete description of the eight Standards for Mathematical Practice, see Appendix B.

References

California Commission on Teacher Credentialing and California Department of Education. 1997. *California Standards for the Teaching Profession.* Sacramento: California Department of Education.

California County Superintendents Educational Services Association. 2011. *K–8 California's Common Core Standards Parent Handbook.* Sacramento: Sacramento County Office of Education.

California Department of Education. 1991. *Fact Sheet 1990-91.* Sacramento: California Department of Education.

———. 2002. *English-Language Development Standards for California Public Schools, Kindergarten Through Grade Twelve.* Sacramento: California Department of Education.

———. 2004a. *Science Framework for California Public Schools, Kindergarten Through Grade Twelve.* Sacramento: California Department of Education.

———. 2005. *History–Social Science Framework for California Public Schools, Kindergarten Through Grade Twelve.* Sacramento: California Department of Education.

———. 2007a. *Closing the Achievement Gap: Report of Superintendent Jack O'Connell's California P-16 Council.* Sacramento: California Department of Education.

———. 2007b. *Reading/Language Arts Framework for California Public Schools, Kindergarten Through Grade Twelve.* Sacramento: California Department of Education.

———. 2008. *California Preschool Learning Foundations, Volume 1.* Sacramento: California Department of Education.

———. 2009. *Physical Education Framework for California Public Schools, Kindergarten Through Grade Twelve.* Sacramento: California Department of Education.

———. 2010a. DataQuest census reports. http://dq.cde.ca.gov/dataquest/ (accessed October 1, 2010).

———. 2010b. *Improving Education for English Learners: Research-Based Approaches.* Sacramento: California Department of Education.

———. 2010c. "State Schools Chief Jack O'Connell Releases 2009-10 Accountability Progress Report." News release, September 13, 2010. Sacramento: California Department of Education.

———. 2011a. *2010-11 Academic Performance Index Reports Information Guide.* http://www.cde.ca.gov/ta/ac/ap/documents/infoguide11.pdf (accessed December 20, 2011).

———. 2011b. *A Blueprint for Great Schools.* http://www.cde.ca.gov/eo/in/bp (accessed January 4, 2012).

———. 2011c. *A Look at Kindergarten Through Grade Six in California Public Schools: Transitioning to the Common Core State Standards in English Language Arts and Mathematics.* Sacramento: California Department of Education.

National Research Council. 2001. *Adding It Up: Helping Children Learn Mathematics.* Washington, DC: National Academy Press.

Preston, Nancy R. 2009. A is for Einstein: The Alphabet Versus the Internet. *Phi Delta Kappan* 91, no. 1 (September 2009).

Sacramento County Office of Education. 2010a. *Recommendations for K–12 Common Core State Standards for English/Language Arts.* Sacramento: Sacramento County Office of Education.

———. 2010b. *Recommendations for K–12 Common Core State Standards for Mathematics.* Sacramento: Sacramento County Office of Education.

U.S. Department of Education. 2007. *No Child Left Behind: Teacher-to-Teacher Initiative.* http://www.ed.gov/teachers/how/tools/initiative/factsheet.pdf (accessed October 1, 2010).