

Chapter Ten

of the

English Language Arts/ English Language Development Framework

*for California Public Schools
Kindergarten Through Grade Twelve*

Adopted by the California State Board of Education, July 2014

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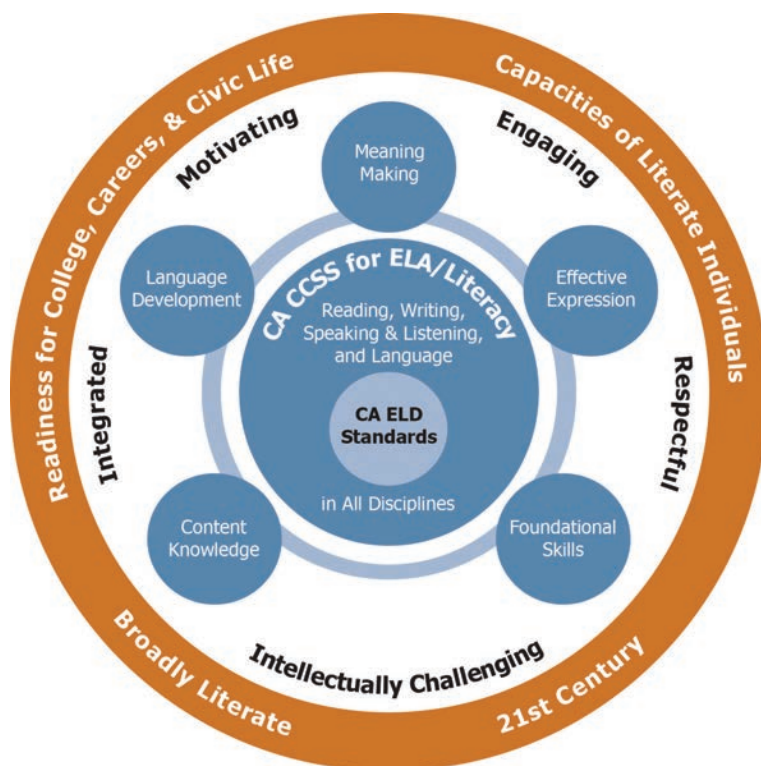
Learning in the 21st Century

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The development of 21st century skills is one of four overarching goals of ELA/literacy and ELD instruction set forth in this framework: Students develop the readiness for college, careers, and civic life; attain the capacities of literate individuals; become broadly literate; and acquire the skills for living and learning in the 21st century. These goals are displayed in the outer ring of figure 10.1. (See the introduction and chapter 2 of this *ELA/ELD Framework*.)

This chapter defines 21st century skills, describes their role in ELA/literacy and ELD programs, and presents associated instructional practices. It concludes with discussions of equitable access, professional learning and teacher support, and future directions. Several snapshots provide examples of effective practice.

Figure 10.1. Circles of Implementation of ELA/Literacy and ELD Instruction



21st Century Skills Defined

All students need to acquire the cognitive and social skills and dispositions that enable them to succeed in the dynamic, fast-paced, and complex world of the 21st century. Recognizing the challenges of the decades ahead, various education, business, and government groups identified sets of skills and dispositions deemed critical for the success of individuals in their pursuit of higher education and careers as well as for responsible citizenship—so called *21st century skills*. Although several frameworks exist that identify 21st century skills, this *ELA/ELD Framework* draws on three. The first two—those developed by the Partnership for 21st Century and the National Research Council’s Committee on Defining Deeper Learning and 21st Century Skills—are comprehensive. They are organized differently, but they include many of the same skills. The third—developed by the Council of Chief State School Officers (CCSSO) and Asia Society Partnership for Global Learning—focuses on one set of 21st century skills: global competencies.

Partnership for 21st Century Skills

The Partnership for 21st Century Skills (P21) (<http://www.p21.org/>) is a national organization of educational nonprofits, foundations, and businesses that advocates for 21st century readiness for all students. Formed in 2002, the organization developed a framework for 21st century learning that consists of student outcomes and systems of support, the latter addressing standards and assessments, curriculum and instruction, professional development, and learning environments. Student outcomes, presented in figure 10.2, are organized into four categories: (1) core subjects (e.g., English, mathematics, science, social studies) and 21st century themes; (2) life and career skills; (3) learning and innovation skills; and (4) information, media, and technology skills. The California Department of Education joined the Partnership in 2013 and is integrating 21st century skills into all academic core content areas, as well as career and technical education.

Figure 10.2. Student Outcomes Identified by the Partnership for 21st Century Skills

| Core Subjects and 21st Century Interdisciplinary Themes | Life and Career Skills | Learning and Innovation Skills (The “4Cs”) | Information, Media, and Technology Skills |
|--|---|---|--|
| Themes include: <ul style="list-style-type: none"> • Global awareness • Financial, economic, business, and entrepreneurial literacy • Civic literacy • Health literacy • Environmental literacy | <ul style="list-style-type: none"> • Flexibility and adaptability • Initiative and self-direction • Social and cross-cultural skills • Productivity and accountability • Leadership and responsibility | <ul style="list-style-type: none"> • Creativity and innovation • Critical thinking and problem solving • Communication and collaboration | <ul style="list-style-type: none"> • Information literacy • Media literacy • Information, communications, and technology literacy |
| <p>Source Partnership for 21st Century Skills, The. 2011a. <i>Overview: Framework for 21st Century Learning</i>.</p> | | | |

Deeper Learning and 21st Century Skills

The Committee on Defining Deeper Learning and 21st Century Skills, commissioned by the National Research Council, was charged with defining “the set of key skills that are referenced by the labels ‘deeper learning,’ ‘21st century skills,’ ‘college and career readiness,’ ‘student centered learning,’ ‘next generation learning,’ ‘new basic skills,’ and ‘higher order thinking’” (National Research Council 2012, 1). The committee organized the skills into three broad categories or domains of competence: (1) cognitive competencies, including cognitive processes and strategies, knowledge, and creativity; (2) intrapersonal competencies, including intellectual openness, work ethic/conscientiousness, and positive core self-evaluation; and (3) interpersonal competencies, including teamwork and collaboration and leadership. Figure 10.3 provides information on these clusters.

The committee report suggests that deeper learning is essential for developing 21st century skills. Deeper learning is defined as “the process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations (i.e., transfer)” (National Research

Deeper learning is defined as “the process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations (i.e., transfer).”

Council 2012, 5). The committee report also states that transferable knowledge is the product of deeper learning and includes both knowledge of content and “knowledge of how, why, and when to apply this [content] knowledge” (6). In other words, students need to learn and apply the cognitive, intrapersonal, and interpersonal competencies now and in the future. Likewise, educators need to learn how to encourage their students’ development and strategic use of such skills.

Figure 10.3. Competencies Identified by the Committee on Defining Deeper Learning and 21st Century Skills

| Cognitive Competencies | Intrapersonal Competencies | Interpersonal Competencies |
|--|---|--|
| <p>Cognitive Processes and Strategies Critical thinking, problem solving, analysis, reasoning, argumentation, interpretation, decision making, adaptive learning, executive function</p> <p>Knowledge Information literacy (research using evidence and recognizing bias in sources), information and communications technology literacy, oral and written communication, active listening¹</p> <p>Creativity Creativity, innovation</p> | <p>Intellectual Openness Flexibility, adaptability, artistic and cultural appreciation, personal and social responsibility (including cultural awareness and competence), appreciation for diversity, continuous learning, intellectual interest and curiosity</p> <p>Work Ethic/Conscientiousness Initiative, self-direction, responsibility, perseverance, productivity, grit, Type 1 self-regulation (metacognitive skills, including forethought, performance, and self-reflection), professionalism/ethics, integrity, citizenship, career orientation</p> <p>Positive Core Self-Evaluation Type 2 self-regulation (self-monitoring, self-evaluation, self-reinforcement) physical and psychological health</p> | <p>Teamwork and Collaboration Communication, collaboration, teamwork, cooperation, coordination, interpersonal skills, empathy/perspective taking, trust, service orientation, conflict resolution, negotiation</p> <p>Leadership Leadership, responsibility, assertive communication, self-presentation, social influence with others</p> |

Source

National Research Council. 2012. *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century*, edited by James W. Pellegrino and Margaret L. Hilton. Committee on Defining Deeper Learning and 21st Century Skills. Washington, DC: The National Academies Press.

¹ As noted throughout this framework, speaking and listening should be broadly interpreted. Speaking and listening should include students who are deaf and hard of hearing using American Sign Language (ASL) as their primary language. Students who are deaf and hard of hearing who do not use ASL as their primary language but use amplification, residual hearing, listening and spoken language, cued speech and sign supported speech, access the general education curriculum with varying modes of communication.

CCSSO EdSteps Initiative and Asia Society Partnership for Global Learning

Both the Partnership for 21st Century Learning and the Committee on Defining Deeper Learning and 21st Century Skills include skills related to global or cultural awareness, appreciation of diversity, and collaboration with others. Similarly, recognizing that global competence is crucial for living and working in the global era of the 21st century, the Council for Chief State School Officers (CCSSO), in collaboration with the Asia Society Partnership for Global Learning, commissioned a task force to identify the capacities of a globally competent student. Global competence is defined as “the capacity and disposition to understand and act on issues of global significance” (Mansilla and Jackson 2011, xiii). The task force determined that students who are globally competent can perform the following:

- Investigate the world beyond their immediate environment, framing significant problems and conducting well-crafted and age-appropriate research
- Recognize perspectives, others’ and their own, articulating and explaining such perspectives thoughtfully and respectfully
- Communicate ideas effectively with diverse audiences, bridging geographic, linguistic, ideological, and cultural barriers
- Take action to improve conditions, viewing themselves as players in the world and participating reflectively

21st Century Skills and the Standards

Both the CA CCSS for ELA/Literacy and the CA ELD Standards are designed to support the development of broadly literate students who have the capacities of literate individuals necessary for success in college, careers, and civic participation in today’s world (CDE 2013b, 6). (See chapter 1 of this *ELA/ELD Framework*.) Development of 21st century skills is crucial for the realization of this goal, and many 21st century skills are integrated into the CCR Anchor Standards, the CA CCSS for ELA/Literacy, and the CA ELD Standards. Thus, as teachers support students’ achievement of these standards, they are at the same time supporting the development of many 21st century skills, and vice versa. Figure 10.4 displays the alignment between the capacities of literate individuals and a sampling of 21st century skills identified by the Partnership for 21st Century Skills (P21), the Committee on Defining Deeper Learning and 21st Century Skills (DL), and the CCSSO EdSteps Initiative and Asia Society Partnership for Global Learning (GL). The 21st century skills included in the figure are representative, not exhaustive.

Both the CA CCSS for ELA/Literacy and the CA ELD Standards are designed to support the development of broadly literate students who have the capacities of literate individuals necessary for success in college, careers, and civic participation in today’s world.

Figure 10.4. Alignment Between the Capacities of Literate Individuals and 21st Century Skills Identified by the Partnership for 21st Century Skills (P21), Committee on Defining Deeper Learning and 21st Century Skills (DL), and the CCSSO EdSteps Initiative and Asia Society Partnership for Global Learning (GL)

| Capacities of Literate Individuals | 21st Century Skills |
|---|--|
| They demonstrate independence. | Self-direction (P21; DL) Metacognition (DL) Executive function (DL) |
| They build strong content knowledge. | Core subjects (P21) Knowledge (DL) Investigate the world (GL) |
| They respond to the varying demands of audience, task, purpose, and discipline. | Critical thinking and problem solving (P21) Perspective taking (DL) Communicate ideas (GL) |
| They comprehend as well as critique. | Critical thinking (P21; DL) Analysis (DL) Reasoning (DL) |
| They value evidence. | Informational literacy (P21) Reasoning (DL) Argumentation (DL) |
| They use technology and digital media strategically and capably. | Information, media, and technology skills (P21) Information and communications technology literacy (DL) |
| They come to understand other perspectives and cultures. | Global awareness (P21) Social and cross-cultural skills (P21) Cultural awareness and competence (DL) Appreciation for diversity (DL) Investigate the world (GL) Recognize perspectives (GL) |

In the next sections of this chapter, five sets of 21st century skills and their relationship to the CA CCSS for ELA/Literacy and CA ELD Standards are highlighted. These include critical thinking, communication and collaboration, creativity and innovation (the “4Cs”), global competence, and technology skills.

Critical Thinking Skills

The need for students to think critically is emphasized by the CA CCSS for ELA/Literacy and CA ELD Standards at all levels and across all strands. Fostering critical thinking by marrying ELA/literacy and 21st century skills supports the development of students’ skills in literacy and responsible citizenship.

Critical thinking is inherent in the capacities of literate individuals. It is stated most clearly in the following:

Students comprehend as well as critique.

Students are engaged and open-minded—but discerning—readers and listeners. They work diligently to understand precisely what an author or speaker is saying, but they also question an author’s or speaker’s assumptions and premises and assess the veracity of claims and the soundness of reasoning. (CDE 2013b, 6) (See also the introduction to this *ELA/ELD Framework*.)

Critical thinking is also one of the learning and innovation skills (the “4Cs”) identified by the Partnership for 21st Century Skills. (See figure 10.2 in this chapter.) Figure 10.5 displays the definition from the Partnership of 21st Century Skills of critical thinking, which, the Partnership argues, involves problem solving.

Figure 10.5. Critical Thinking

| |
|---|
| <p>Reason Effectively</p> <ul style="list-style-type: none">• Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation <p>Use Systems Thinking</p> <ul style="list-style-type: none">• Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems <p>Make Judgments and Decisions</p> <ul style="list-style-type: none">• Effectively analyze and evaluate evidence, arguments, claims, and beliefs• Analyze and evaluate major alternative points of view• Synthesize and make connections between information and arguments• Interpret information and draw conclusions based on the best analysis• Reflect critically on learning experiences and processes <p>Solve Problems</p> <ul style="list-style-type: none">• Solve different kinds of non-familiar problems in both conventional and innovative ways• Identify and ask significant questions that clarify various points of view and lead to better solutions |
| <p>Source Partnership for 21st Century Skills, The. 2009. <i>P21 Framework Definitions</i>, 4.</p> |

Many of the CA CCSS for ELA/Literacy and CA ELD Standards demand critical thinking. Students evaluate text and consider claims. They determine points of view and explore the impact of word choices. They evaluate language use. Representative CCR Anchor Standards of the CA CCSS for ELA/Literacy and Critical Principles of the CA ELD Standards that require critical thinking are presented in figure 10.6.

Figure 10.6. Selected CCR Anchor Standards of the CA CCSS for ELA/Literacy and Critical Principles of the CA ELD Standards that Demand Critical Thinking

CCR Anchor Standard: Reading

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.
7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
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.

CCR Anchor Standard: Writing

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

CCR Anchor Standard: Speaking and Listening

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.

CCR Anchor Standard: 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.

CA ELD Standards Critical Principle: Part I - Collaborative

3. Offering and justifying opinions, negotiating with and persuading others in communicative exchanges

CA ELD Standards Critical Principle: Part I - Interpretive

6. Evaluating how well writers and speakers use language to support ideas and arguments with details or evidence depending on modality, text type, purpose, audience, topic, and content area
7. Reading closely literary and informational texts and viewing multimedia to determine how meaning is conveyed explicitly and implicitly through language
8. Analyzing how writers and speakers use vocabulary and other language resources for specific purposes (to explain, persuade, entertain, etc.) depending on modality, text type, purpose, audience, topic, and content area

CA ELD Standards Critical Principle: Part I - Productive

10. Writing literary and informational texts to present, describe, and explain ideas and information, using appropriate technology
11. Justifying own arguments and evaluating others' arguments in writing

CA ELD Standards Critical Principle: Part II - Structuring Cohesive Texts

1. Understanding text structure and organization based on purpose, text type, and discipline

As students engage with texts, they learn to consider the following: Who is privileged? Who is marginalized? Who and what is missing? Who is the author? What is the author's objective? What are the author's perspectives and biases? Does the author adequately support claims?

Instruction in critical thinking occurs in all grade levels and with all students. As students engage with texts, they learn to consider the following: Who is privileged? Who is marginalized? Who and what is missing? Who is the author? What is the author's objective? What are the author's perspectives and biases? Does the author adequately support claims? These questions should be asked of every type of text in every discipline.

The *Model School Library Standards for California Public Schools, Kindergarten Through Grade Twelve* (<http://www.cde.ca.gov/be/st/ss/documents/librarystandards.pdf>) (CDE 2010) also provides grade-level standards that address evaluation of information in text and other sources. For example, students:

- Understand that the Internet contains accurate and inaccurate information. (Grade Two, Standard 2.1c)
- Identify the factors that make a source comprehensive, current, credible, authoritative, and accurate. (Grade Four, Standard 2.2a)
- Assess the author's evidence to support claims and assertions, noting instances of bias and stereotypes in a variety of visual and audio materials. (Grades Seven and Eight, Standard 2.1a)
- Evaluate online search results, demonstrating an understanding of how search engines determine rank or relevancy. (Grades Nine through Twelve, Standard 2.1a)

In addition, critical thinking is addressed in all academic core content areas and *California Career and Technical Education Model Curriculum Standards* (<http://www.cde.ca.gov/ci/ct/sf/documents/ctestdfontpages.pdf>) (CDE 2013a). It is important to note that critical thinking is not context-free; it is embodied in particular ways in different disciplines (National Research Council 2012).

The Model School Library Standards for California Public Schools, Kindergarten Through Grade Twelve also provides grade-level standards that address evaluation of information in text and other sources.

Snapshot 10.1. Online Cold War Museum Exhibit in Grade Eleven

As part of their study of U.S. foreign policy since World War II, students in an eleventh-grade history class select a topic for independent research. One student, Birtu, selects the Cold War and gathers and reviews relevant information from multiple authoritative print and digital sources, including those from outside the U.S., to ensure a variety of perspectives. Based on past instructional input and experiences, she critically analyzes the materials for bias and then makes decisions about which sources to use and identifies key information. Birtu then develops an online museum exhibit designed to answer the question, “What weapons were most successful in waging the Cold War?” Her exhibit includes a variety of virtual artifacts, including declassified Department of State documents, Presidential Executive Orders, and archival images and video clips from the National Archives. Birtu writes brief texts about each of the artifacts, which can be accessed by clicking on an icon she posts in the museum. Each item is briefly described, cited in detail, and linked to its original source. In addition, Birtu posts a brief report in which she presents an argument for her choices of sources, indicating why some were included and others were excluded. Her online museum is posted on the class Web site for classmates to view.

CA CCSS for ELA/Literacy: SL.11–12.5; RH.11–12.2; RH.11–12.7; WHST.11–12.7

Related Model School Library Standards:

9-12, 2.2e Use systematic strategies and technology tools to organize and record information (e.g., anecdotal scripting, footnotes, annotated bibliographies).

9-12, 3.3d Produce media efficiently and appropriately to communicate a message to an audience.

Related CA History–Social Science Content Standards:

11.9 Students analyze U.S. foreign policy since World War II.

11.9.2 Understand the role of military alliances, including NATO and SEATO, in deterring communist aggression and maintaining security during the Cold War.

11.9.3 Trace the origins and geopolitical consequences (foreign and domestic) of the Cold War and containment policy, including the following:

- The era of McCarthyism, instances of domestic Communism (e.g., Alger Hiss) and blacklisting
- The Truman Doctrine
- The Berlin Blockade
- The Korean War
- The Bay of Pigs invasion and the Cuban Missile Crisis
- Atomic testing in the American West, the “mutual assured destruction” doctrine, and disarmament policies
- The Vietnam War
- Latin American policy

11.9.5 Analyze the role of the Reagan administration and other factors in the victory of the West in the Cold War.

21st Century Skills: communication and collaboration, creativity, problem solving, media and technology skills, information literacy, self-direction

Communication and Collaboration Skills

Communication and collaboration skills are among the “4Cs” identified by the Partnership for 21st Century Skills. These skills are significant components of the CA CCSS for ELA/Literacy and the CA ELD Standards as well as every content area.

Attention to effective communication occurs in each of the strands of the CA CCSS for ELA/Literacy and throughout the collaborative, interpretive, and productive modes of the CA ELD Standards. Students write for a variety of audiences and for a variety of purposes using a variety of

Attention to effective communication occurs in each of the strands of the CA CCSS for ELA/Literacy and throughout the collaborative, interpretive, and productive modes of the CA ELD Standards.

media; they learn to communicate effectively with peers, adults, and external, sometimes unfamiliar, audiences. In discussions and presentations, students attend to one another’s ideas and convey their own clearly; they question and clarify to ensure understanding; they consider and evaluate point of view and follow and develop lines of argument; they interpret and strategically use diverse media to enhance communication; and they adapt their communicative efforts to a variety of contexts and tasks. Language standards focus on building students’ skill with language conventions—grammar, usage, and mechanics—as well as acquisition and accurate use of vocabulary and phrases, including nuances in word meanings and figurative

language, so that students express themselves effectively. Reading standards include analysis of authors’ use of craft and structure to communicate with readers. In short, communication is a cornerstone of ELA/literacy and ELD instruction.

Collaboration, too, is a prominent theme in the CA CCSS for ELA/Literacy and the CA ELD Standards. Reading is sometimes a solitary act, especially as students engage in independent reading, but it is often a social act as students work together to engage in meaning making with text, produce and publish their own texts, and conduct research and share knowledge through a variety of media. The importance of collaboration is highlighted in CCR Anchor Standard 1 for Speaking and Listening: “Students 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.” Collaboration is also emphasized throughout all four strands in the collaborative mode of the CA ELD Standards, with students collaborating in both oral and written language for multiple purposes using various forms of technology. Teachers at all grade levels and in all disciplines should plan for collaboration and ensure that students engage with diverse partners for diverse purposes.

Communication and collaboration extend well beyond the classroom and face-to-face interactions. With technological advances in recent years, there is no need for individuals to be in close physical proximity to engage in joint work. Work can be accomplished in electronically connected groups (including online global learning networks investigating shared real-life concerns) in ways that were never before possible.

Distance and group dynamics are important to consider when students engage in electronic workgroups. Since there are few interpersonal clues to assist members of a workgroup, members rely more on the content and perspective of the message to communicate effectively. This is true of both receptive and expressive communication. For example, in face-to-face collaborations, nonverbal cues, such as facial expressions and gestures, can contribute to understanding and also reveal confusion, frustration, satisfaction,

Teachers at all grade levels and in all disciplines should plan for collaboration and ensure that students engage with diverse partners for diverse purposes.

agreement, or other reactions of group members to one another's ideas. Students, then, know to clarify their ideas by restating, demonstrating, or providing a quick sketch, or they know the group has reached consensus and is ready to move on to the next step. To enhance communication, electronic workgroups need to establish protocols for posing questions, acceptable terminology, and forming responses. Furthermore, they need to develop and follow agreed-upon guidelines for building on one another's contributions, such as when creating a group document or presentation.

Social networking is a special case of collaboration, but it often occurs without the specific purpose of more conventional collaborations or workgroups. In light of the popular use of social media by their students and its potential to offer borderless communication and collaboration, teachers should include instruction in appropriate purposes, behavior, and alternatives based on district guidelines and use policies. (Anderson [2012] provides a process for creating guidelines.)

Snapshot 10.2. Integrating Technology into an Extended Science Writing Project in Grade Two

After reading and discussing several informational books about reptiles, second graders work in pairs to write their own informational text about a reptile of their choice. With the teacher and teacher librarian's assistance, they gather books from the library, view relevant video clips, and explore selected Web sites on the Internet using search terms discussed with the adult. They write a list of key ideas in several categories, such as appearance, habitat, and eating habits. They also record special vocabulary. Students researching the common snapping turtle, for example, record the terms *rigid carapace*, *freshwater*, and *omnivore* because they want to be sure to use these terms in their text. Each pair creates a draft modeled after the texts the teacher read aloud, discussed with the class, and placed on display for easy access. Teachers conference with each pair to review students' drafts and provide feedback and guidance. Teachers encourage students to reflect on their work and consider how they will use the feedback they receive. When ready, each student pair develops a final version, having made page layout decisions, and includes informational text features appropriate to their piece of writing, such as a table of contents, bolded words, captions, and headings.

As a finishing touch on their projects, students add Quick Response (QR) Codes to each page of their books, a technology with which they previously had gained experience. Each code allows viewers of the book to use a class QR reader (such as an app installed on a tablet or smartphone) to listen to translations that bilingual students record. This provides opportunities for ELs to interact with the book in their primary language in addition to English. Moreover, the books may be shared with family members in their primary language.

CA CCSS for ELA/Literacy: W.2.2, 6, 7; RI.2.5; SL.2.5, 6; L.2.1–3

CA ELD Standards: ELD.PI.2.1, 2, 4, 10, 12; ELD.PII.2.1-7

Related Model School Library Standards:

2-1.3g Identify the parts of a book (print and digital): table of contents, glossary, index, and dedication.

2-1.4c Connect prior knowledge to the information and events in text and digital formats.

Related Next Generation Science Standard:

2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.]

21st Century Skills: communication and collaboration, creativity, problem solving, media and technology skills

Creativity and Innovation Skills

Creativity and innovation are essential skills for success in the 21st century. California State Superintendent's *A Blueprint for Great Schools* highlights the important role of innovation: "The end goal is to foster each student's ability to create innovative solutions to complex problems and to bring higher levels of economic prosperity and social cohesion." (CDE 2011a, 11) In fact, a survey for Association of American Colleges and Universities revealed that employers give hiring preference to college graduates with skills that enable them to contribute to innovation in the workplace (Hart Research Associates 2013, 1).

California's recognition of the value of creativity and innovation is reiterated in the Standards for Career Ready Practice, described in the *California Career Technical Education Model Curriculum Standards* (CDE 2013a, 17-18). Standard 10 states that students in all career exploration and preparation programs in grades seven through twelve should demonstrate creativity and innovation:

Career-ready individuals recommend ideas that solve problems in new and different ways and contribute to the improvement of the organization. They consider unconventional ideas and suggestions by others as solutions to issues, tasks, or problems. They discern which ideas and suggestions may have the greatest value. They seek new methods, practices, and ideas from a variety of sources and apply those ideas to their own workplace practices.

Elements of creativity and innovation described by the Partnership for 21st Century Skills are displayed in Figure 10.7.

Figure 10.7. Creativity and Innovation

Think Creatively

- Use a wide range of idea creation techniques (such as brainstorming)
- Create new and worthwhile ideas (both incremental and radical concepts)
- Elaborate, refine, analyze, and evaluate their own ideas in order to improve and maximize creative efforts

Work Creatively with Others

- Develop, implement, and communicate new ideas to others effectively
- Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work
- Demonstrate originality and inventiveness in work and understand the real world limits to adopting new ideas
- View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes

Implement Innovations

- Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur

Source

Partnership for 21st Century Skills, The. 2009. *P21 Framework Definitions*, 4.

It is imperative that all of California’s students be provided educational programs and environments in which creativity is valued, encouraged, and taught in every discipline. Furthermore, time and guidance should be provided so that students can put their creative ideas into practice as they engage in innovation. Creativity and innovation can be nurtured by learning environments that “foster questioning, patience, openness to fresh ideas, high levels of trust, and learning from mistakes and failures” (Trilling and Fadel 2009, 57–58).

Creativity and innovation can be nurtured by learning environments that “foster questioning, patience, openness to fresh ideas, high levels of trust, and learning from mistakes and failures.”

Although creativity and innovation are not explicitly addressed in the CA CCSS for ELA/Literacy or the CA ELD Standards, development of these skills is implied, particularly in writing and presenting standards (Partnership for 21st Century Skills 2011b, 12). Creativity and innovation should be fostered as students engage with texts and ideas. Students should have many opportunities to creatively respond to texts, produce texts, develop and deliver presentations, and engage in research to explore their own questions. Imagination, flexibility, divergent thinking, receptiveness to the ideas of others, and willingness to explore and take risks should be emphasized in the ELA/literacy curricula and in every content area.

Global Awareness and Competence

California’s wealth of diverse linguistic and cultural resources reflected in its people are extraordinarily valuable assets for the state. All of California’s students should be provided instruction and opportunities to appreciate, understand, and work with individuals from different backgrounds.

California’s wealth of diverse linguistic and cultural resources reflected in its people are extraordinarily valuable assets for the state. All of California’s students should be provided instruction and opportunities to appreciate, understand, and work with individuals from different backgrounds. Furthermore, they should learn about global issues—those that impact more than their neighborhoods and the nation—and develop an understanding of different perspectives and the interrelationships among all humans. The global competences identified by the CCSSO EdSteps Initiative and Asia Society Partnership for Global Learning, discussed at the beginning of this chapter, are aligned with CCR Anchor Standards and CA ELD Standards in figure 10.8.

Figure 10.8. Global Competences Aligned with CCR Anchor Standards of the CA CCSS for ELA/Literacy

| Global Competence* | CCR Anchor Standard or CA ELD Standards Critical Principles |
|---|---|
| <p>Investigate the world beyond their immediate environment</p> <ul style="list-style-type: none"> • Identify an issue, generate a question, and explain the significance of locally, regionally, and globally focused researchable questions • Use a variety of languages and domestic and international sources to identify and weigh relevant evidence in addressing a globally significant researchable question • Analyze, integrate, and synthesize evidence to construct coherent responses to globally significant researchable questions • Develop an argument based on compelling evidence that considers multiple perspectives and draws defensible conclusions | <p>Reading Anchor Standard 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.</p> <p>Reading Anchor Standard 2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.</p> <p>Reading Anchor Standard 3: Analyze how and why individuals, events, and ideas develop and interact over the course of a text.</p> <p>Reading Anchor Standard 6: Assess how point of view or purpose shapes the content and style of a text.</p> <p>Reading Anchor Standard 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.</p> <p>Reading Anchor Standard 10: Read and comprehend complex literary and informational texts independently and proficiently.</p> <p>Writing Anchor Standard 1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.</p> <p>Writing Anchor Standard 4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>Writing Anchor Standard 7: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.</p> <p>Writing Anchor Standard 9: Draw evidence from literary or informational texts to support analysis, reflection, and research.</p> <p>Speaking and Listening Anchor Standard 2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.</p> <p>Speaking and Listening Anchor Standard 3: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric.</p> <p>Speaking and Listening Anchor Standard 5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.</p> <p>ELD Standards Critical Principle: Part I - Productive, 11: Justifying own arguments and evaluating others’ arguments in writing</p> |

| Global Competence* | CCR Anchor Standard or CA ELD Standards Critical Principles |
|---|---|
| <p>Recognize perspectives, others' and their own</p> <ul style="list-style-type: none"> Recognize and express their own perspective on situations, events, issues, or phenomena and identify the influences on that perspective Examine perspectives of other people, groups, or schools of thought and identify the influences on those perspectives Explain how cultural interactions influence situations, events, issues, or phenomena, including the development of knowledge Articulate how differential access to knowledge, technology, and resources affects quality of life and perspectives | <p>Reading Anchor Standard 6: Assess how point of view or purpose shapes the content and style of a text.</p> <p>Reading Anchor Standard 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.</p> <p>Writing Anchor Standard 1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.</p> <p>Writing Anchor Standard 4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>Writing Anchor Standard 6: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.</p> <p>Writing Anchor Standard 7: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.</p> <p>Writing Anchor Standard 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.</p> <p>Speaking and Listening Anchor Standard 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.</p> <p>Speaking and Listening Anchor Standard 2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.</p> <p>Speaking and Listening Anchor Standard 3: Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.</p> <p>Language Anchor Standard 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.</p> <p>ELD Standards Critical Principle: Part I - Interpretive, 8: Analyzing how writers and speakers use vocabulary and other language resources for specific purposes (to explain, persuade, entertain, etc.) depending on modality, text type, purpose, audience, topic, and content area</p> |

| Global Competence* | CCR Anchor Standard or CA ELD Standards Critical Principles |
|--|---|
| <p>Communicate ideas effectively with diverse audiences</p> <ul style="list-style-type: none"> • Recognize and express how diverse audiences may perceive different meanings from the same information and how that impacts communication • Listen to and communicate effectively with diverse people, using appropriate verbal and nonverbal behavior, languages, and strategies • Select and use appropriate technology and media to communicate with diverse audiences • Reflect on how effective communication impacts understanding and collaboration in an interdependent world | <p>Writing Anchor Standard 1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.</p> <p>Writing Anchor Standard 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.</p> <p>Writing Anchor Standard 4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>Writing Anchor Standard 7: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.</p> <p>Writing Anchor Standard 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.</p> <p>Writing Anchor Standard 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.</p> <p>Speaking and Listening Anchor Standard 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.</p> <p>Speaking and Listening Anchor Standard 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.</p> <p>Language Anchor Standard 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.</p> <p>ELD Standards Critical Principle: Part I - Collaborative, 1: Exchanging information and ideas with others through oral collaborative discussions on a range of social and academic topics</p> |

| Global Competence* | CCR Anchor Standard or CA ELD Standards Critical Principles |
|---|--|
| <p>Take action</p> <ul style="list-style-type: none"> • Identify and create opportunities for personal or collaborative action to address situations, events, issues, or phenomena in ways that improve conditions • Assess options and plan actions based on evidence and the potential for impact, taking into account previous approaches, varied perspectives, and potential consequences • Act, personally or collaboratively, in creative and ethical ways to contribute to improvement locally, regionally, or globally and assess the impact of the actions taken • Reflect on their capacity to advocate for and contribute to improvement locally, regionally, or globally | <p>Reading Anchor Standard 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.</p> <p>Writing Anchor Standard 1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.</p> <p>ELD Standards Critical Principle: Part I - Productive, 9: Expressing information and ideas in formal oral presentations on academic topics</p> <p>ELD Standards Critical Principle: Part I - Productive, 11: Justifying own arguments and evaluating others' arguments in writing</p> <p>ELD Standards Critical Principle: Part I - Productive, 12: Selecting and applying varied and precise vocabulary and other language resources to effectively convey ideas</p> |
| <p>*Source Mansilla, Veronica B., and Anthony Jackson. 2011. <i>Educating for Global Competence: Preparing Our Youth to Engage the World</i>. The Asia Society.</p> | |

Technology Skills

Technology pervades modern society. It impacts most aspects of the personal and academic/professional lives of youth and adults. Furthermore, it has the potential to substantially support the achievement of many of the 21st century skills discussed previously in this chapter: Its wise use demands critical thinking, it expands and enriches opportunities for communication and collaboration, it is a powerful tool for creativity and innovation, and it can contribute to global awareness and competence. Furthermore, technology as a tool for learning and expression can contribute to progress in each of the themes of the CA CCSS for ELA/ELD and the CA ELD Standards: Meaning Making, Language Development, Effective Expression, Content Knowledge, and Foundational Skills.

The question is not whether technology should be used in classrooms, but rather how best to capitalize on technology to support teachers and learners.

The question is not *whether* technology should be used in classrooms, but rather how *best* to capitalize on technology to support teachers and learners. In its report *A Blueprint for Great Schools*, the Transition Advisory Team for the California State Superintendent recommended that technology be incorporated “as a key component of teaching, learning, and assessment” (CDE 2011a, 5) and that digital technology be made “as effective and

productive a tool in the school environment as it is in the world beyond schools” (12). Surveys indicate that parents, too, consider technology important or extremely important to student success and the school’s core mission (Project Tomorrow 2013, 4).

Important in the context of this *ELA/ELD Framework* is that the Internet and other forms of information and communication technologies (ICTs) are redefining literacy (International Reading Association 2009). Students increasingly engage with search engines, Web pages, podcasts and vodcasts, blogs, e-books, wikis, and the ongoing flood of new ICTs in English and other languages. Students should learn how to critically harness and manage the power of these media for accessing, evaluating, creating, and sharing information with local and global others. At the same time, teachers should ensure that students learn how to use technologies safely and ethically.

The International Reading Association (2009) notes that the use of these new and dynamic forms of communication require new social practices, skills, strategies, and dispositions; are central to full civic, economic, and personal participation in a global community; rapidly change as technologies change; and are multiple, multimodal, and multifaceted. The incorporation of a range of technologies into ELA/literacy and ELD instruction is crucial and demands thoughtful attention.

Technology skills are woven throughout the CCR Anchor Standards and CA CCSS for ELA/Literacy. Among the technology skills identified in the standards are the following:

- Use the Internet
- Use search tools
- Use keyboarding skills
- Engage with digital text, including animations and interactive elements on Web pages
- Use digital media, including textual, graphical, audio, visual, and interactive elements
- Produce digital text
- Use electronic menus
- Consult digital reference materials
- Interpret and produce multimedia presentations

The CA ELD Standards, too, demand technology skills, including the following:

- Use communicative technology to interact with others
- Use technology for publishing
- Use technology to develop graphics
- View multimedia

Snapshot 10.3. Electronic Book Trailers in Grade Six

Because she understands the cumulative advantage of reading volume, Ms. Edwards ensures that her sixth-grade students have many opportunities to engage in independent reading. She has a wide selection of texts available in the classroom, and she meets with individuals regularly to discuss their selections and make recommendations. Knowing that peers have a powerful influence on one another, she has students create book trailers of favorite literature that serve to pique prospective readers' interest, just as movie trailers draw viewers into a theatre. Students are given the option to work alone or in small teams if several students have read the same book and wish to collaborate on the project. Ms. Edwards shows several movie trailers, and students discuss the important features. How long are the trailers? How many individual scenes are included? What techniques are employed by the producers? Which techniques do they, the viewers, find effective? Which movies do they want to see as a result of viewing the trailers? Why? The teacher also reminds students of the available technology in the classroom; the students have used the digital cameras and moviemaking software for other projects.

Each student or team of students begins by brainstorming the appealing aspects of their selected book and they think about how they might convince their peers that the book is worth reading. Then, after instruction and plenty of examples, they develop story boards (plans to guide production) and write a script. Students keep in mind that the intent of the book trailer is to inspire others, including peers around the globe, to read the book. They consider the images, sound, and language they will use as well as the organization and presentation, always with their audience in mind. They film, download images from the Internet (careful to avoid copyright violations), add text, and include an opening screen and a credit roll. They share their first draft with the teacher and take advantage of feedback to revise, edit, and polish their work. Over several days, the book trailers are shared. Students applaud one another's work. Book trailers are kept in an electronic file on a class computer for occasional viewing by peers when they are ready to select their next book for independent reading. They are also posted online so the students' recommendations can be accessed by other students, parents, and a global audience. They are clearly labeled by genre, discipline, and age span.

CA CCSS for ELA/Literacy: RL.6.2; W.6.6; SL.6.2, 4–6; L.6.1, 2

Related Model School Library Standards:

6-3.3a Choose an appropriate format to produce, communicate, and present information (e.g., written report, multimedia presentation, graphic presentation).

6-4.3a Demonstrate a variety of methods to engage the audience when presenting information (e.g., voice modulation, gestures, questions).

21st Century Skills: communication and collaboration, creativity, problem solving, media and technology skills, global competence

Figure 10.9 lists CCR Anchor Standards and CA ELD Standards Critical Principles that explicitly include technology and provides one or two examples of corresponding grade-level/proficiency-level standards. Also listed in figure 10.9 are CCR Anchor Standards that do not explicitly mention technology but that have corresponding grade-level standards that mention technology. It is important to note that even standards that do not explicitly mention technology may be addressed with technology. For example, Writing Standard 2 across the grade levels focuses on informative and explanatory writing. Technology is not indicated in the CCR Anchor Standard nor in any of the corresponding CA CCSS for ELA/Literacy. However, at most grade levels, teachers encourage or require students to use the Internet to conduct research in preparation for some writing, use word processing software to prepare some of these texts, including graphs and charts, and use multimedia software to present some student-written informative and explanatory texts.

The standards recognize that students at all grade levels, even in the earliest grades, need opportunities to interact with technology. Writing Standard 6 for kindergarten, for example, states “With guidance and support from adults, explore a variety of digital tools to produce and publish writing, including in collaboration with peers.” Guidance for young children’s use of technology is provided in *Technology and Interactive Media as Tools in Early Childhood Programs Serving Children from Birth through Age 8* (https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/resources/topics/PS_technology_WEB.pdf) (2012), the position statement of the National Association for the Education of Young Children and the Fred Rogers Center for Early Learning and Children’s Media at Saint Vincent College. Importantly, the guidelines assert that “Effective uses of technology and media are active, hands-on, engaging, and empowering; give the child control; provide adaptive scaffolds to ease the accomplishment of tasks; and are used as one of many options to support children’s learning” (8).

Figure 10.9. CCR Anchor Standards and CA ELD Standards Critical Principles and Selected Grade-Level/Proficiency-Level Standards with Explicit Technology Components (technology component in blue, bolded text)

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| <p>Reading Anchor Standard 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.</p> <ul style="list-style-type: none"> • <i>Grade-Level Example:</i> RI.2.5 Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently. • <i>Grade-Level Example:</i> RI.3.5 Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently. |
| <p>Reading Anchor Standard 7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.</p> <ul style="list-style-type: none"> • <i>Grade-Level Example:</i> RL.2.7 Use information gained from the illustrations and words in print or digital text to demonstrate understanding of its characters, setting, or plot. • <i>Grade-Level Example:</i> RH.11–12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem. |
| <p>Writing Anchor Standard 6: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.</p> <ul style="list-style-type: none"> • <i>Grade-Level Example:</i> W.K.6 With guidance and support from adults, explore a variety of digital tools to produce and publish writing, including in collaboration with peers. • <i>Grade-Level Example:</i> W.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. |
| <p>Writing Anchor Standard 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.</p> <ul style="list-style-type: none"> • <i>Grade-Level Example:</i> W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. • <i>Grade-Level Example:</i> WHST.6.8 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. |

Speaking and Listening Anchor Standard 2: Integrate and evaluate information presented in diverse **media** and formats, including visually, quantitatively, and orally.

- *Grade-Level Example:* SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other **media**.
- *Grade-Level Example:* SL.11–12.2 Integrate multiple sources of information presented in diverse formats and **media** (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data
- *Grade-Level Example:* SL.11–12.5 Make strategic use of **digital media** (e.g., **textual, graphical, audio, visual,** and **interactive elements**) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

Speaking and Listening Anchor Standard 5: Make strategic use of **digital media** and visual displays of data to express information and enhance understanding of presentations.

- *Grade-Level Example:* SL.5.5 Include **multimedia components** (e.g., **graphics, sound**) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

Language Anchor Standard 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.

- *Grade-Level Example:* L.2.4e Use glossaries and beginning dictionaries, both print and **digital**, to determine or clarify the meaning of words and phrases in all content areas.
- *Grade-Level Example:* L.9–10.4c Consult general and specialized reference materials (e.g., college-level dictionaries, rhyming dictionaries, bilingual dictionaries, glossaries, thesauruses), both print and **digital**, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology.

ELD Standards Critical Principle: Part I - Collaborative, 2: Interacting with others in written English in various communicative forms (print, **communicative technology**, and **multimedia**)

- *Grade-Level Example:* Grade 3/Emerging: Collaborate with peers on joint writing projects of short informational and literary texts, using **technology** where appropriate for publishing, graphics, and the like.
- *Grade-Level Example:* Grade 8/Bridging: Engage in extended written exchanges with peers and collaborate on complex written texts on a variety of topics, using **technology** when appropriate.

ELD Standards Critical Principle: Part I - Interpretive, 6: Reading closely literary and informational texts and viewing **multimedia** to determine how meaning is conveyed explicitly and implicitly through language

- *Grade-Level Example:* Grade K/Expanding: Describe ideas, phenomena (e.g., how butterflies eat), and text elements (e.g., setting, characters) in greater detail based on understanding of a variety of grade-level texts and viewing of **multimedia** with moderate support.
- *Grade-Level Example:* Grade 7/Bridging: (a) Explain ideas, phenomena, processes, and text relationships (e.g., compare/contrast, cause/effect, problem/solution) based on close reading of a variety of grade-level texts and viewing of **multimedia** with light support.

ELD Standards Critical Principle: Part I - Productive, 10: Writing literary and informational texts to present, describe, and explain ideas and information, using appropriate **technology**

- *Grade-Level Example:* Grade 2/Emerging: Write very short literary texts (e.g., story) and informational texts (e.g., a description of a volcano) using familiar vocabulary collaboratively with an adult (e.g., joint construction of texts), with peers, and sometimes independently.
- *Grade-Level Example:* Grade 9–10/Expanding: (a) Write longer literary and informational texts (e.g., an argument about water rights) collaboratively (e.g., with peers) and independently by using appropriate text organization and growing understanding of register.

Understanding Multimedia Text

Much of the text encountered on the Internet and in electronic formats has both conventional print elements and other media—graphics, sound, video, or animations. These types of texts are often labeled *multimedia* documents. Sites exist with no conventional text that convey all meaning through other media. Students need to learn how multimedia elements affect the messages being conveyed by a document. They need to know when to attend to these elements and when they are less important. Mayer (1997) demonstrated that graphics may be more useful for learners who have little prior knowledge on the topic under exploration than those who have considerable knowledge of the topic. Sung and Mayer (2012) distinguish among three types of graphics: instructive graphics (i.e., directly relevant to the instructional goal); seductive graphics (i.e., highly interesting but not directly relevant to the instructional goal); and decorative graphics (i.e., neutral but not directly relevant to the instructional goal). Their research indicated that instructive graphics produced better learning. The implication is that, at the very least, students should be taught how to distinguish among these types of graphics.

Because all texts are not equally valuable or well written, the reader needs to decide when and how to use hyperlinks, attend to multimedia, and be critical in evaluating the content.

Kim and Kamil (2003) identified some of the issues with multimedia in text. They note that media need to be clearly elaborated and integrated with conventional text and that text and other media need to be presented contiguously to be maximally effective. They also state that students need to learn how to read and use hyperlinks effectively to prevent some students from routinely clicking all hyperlinks in the text rather than ones that might be relevant to their purposes for reading. Because all texts are not equally valuable or well written, the reader needs to decide when and how to use hyperlinks, attend to multimedia, and be critical in evaluating the content. Since instruction using multimedia does not necessarily yield more learning and is not always more motivational than other instructional options, teachers should be critical in their review of multimedia resources.

Using Software

Specific software skills need to be taught in order to prepare students for using technologies as tools. At a minimum, students should be prepared to use word processors, database managers, spreadsheets, and presentation software by the time they complete high school. Students are likely to encounter these types of software in some form in educational and work settings. Building facility with such programs early helps students navigate newer programs as they evolve.

Word processing has been used extensively in schools for many years. Such programs are an excellent way to facilitate writing development and reflect the need to prepare students for the world of work or college where the use of such programs is nearly universal. Although much of this will be taught as part of literacy instruction, a large portion of this instruction also should be incorporated in other disciplines.

Students should use presentation programs to create their own multimedia documents as a way of preparing for the world after high school. Combining the various dimensions of language communication (that is, reading, writing, speaking, and listening) and multimedia text in instruction is consistent with the CA CCSS for ELA/Literacy and the CA ELD Standards. Database and spreadsheet programs are useful in teaching research skills as well as search strategies. Instruction in the use of these programs helps students process information more directly and efficiently.

Online Learning

Online delivery of instruction is increasingly popular. More than one million kindergarten through grade-twelve students enrolled in at least one online course in 2007–08, although most of these courses were at the high school level or in an elementary/secondary setting (U.S. Department of Education 2009/10). Online courses offer distinct advantages to districts in terms of cost and convenience, especially for districts where students are distributed across a wide geographic area and there are challenges in delivering instruction in specific content areas.

Online learning will be an essential part of the future, both in school as well as out of school. Students should be prepared to learn in an online medium and should experience online learning in an instructional context during their elementary and secondary school careers. The relative newness of online learning and the limited number of studies available suggest that districts should approach online instruction with caution, especially when the material is intended to replace face-to-face instruction rather than to enhance it. A number of the skills that students need in order to complete online learning are affective in nature (e.g., perseverance and independence), and instruction in online learning is planned with these skills in mind. As noted earlier, these types of skills are reflected in the capacities of literate individuals described in chapter 1 of this *ELA/ELD Framework* and also listed in figure 10.4 of this chapter. They are also prominent in the intrapersonal and interpersonal cluster of deeper learning described at the beginning of this chapter and presented in figure 10.3.

Technology and Assessment

Technology and other 21st century skills are an integral part of the new assessment systems for the CA CCSS for ELA/Literacy. The multistate Smarter Balanced Assessment Consortium (SBAC), of which California is a governing member, includes computer-adaptive assessments that can respond to a student's initial performance to more rapidly and accurately identify which skills the student has mastered. These assessments also allow for a faster turnaround of test results, so they can be used to inform instruction. More information on assessment is provided in chapter 8 and throughout this *ELA/ELD Framework*.

Digital Citizenship

Issues related to ethics, privacy, plagiarism, and cyberbullying warrant careful attention. Digital citizenship refers to responsible and appropriate use of technology. Teachers should be well versed in district and school policies as well as legal issues and should teach students about these issues. The *Model School Library Standards for California Public Schools, Kindergarten Through Grade Twelve* (CDE 2010) provides guidance. It includes standards related to the ethical, legal, and safe use of information in print, media, and online resources for every grade level. Examples include the following:

Kindergarten 3.1b: Understand the need to ask a trusted adult for permission when asked to provide personal information in person, on a form, or online.

Grade Four 3.1b: Understand the environment of Internet anonymity and that not everyone on the Internet is truthful and reliable.

Grades Seven and Eight 3.1c: Explain ethical and legal issues related to the use of intellectual property, including print, visual, audio, and online materials (e.g., fair use, file sharing).

Grades Nine Through Twelve 3.1i: Practice strategies to protect digital devices (e.g., antivirus software, secure connections, encryption, operating-system updates).

In addition, guidance for the safe and responsible use of social media should be addressed.

Home-School-Community Connections

Technology can contribute to home-school-community relationships, which California recognizes are fundamental to improved student learning outcomes (CDE 2011a, 2011b). Opportunities for

communication are expanded significantly through the use of e-mail, videoconferencing, and social media tools. One survey revealed that more than one-third of parents would like their child's teacher or school to communicate with them via text messaging (Project Tomorrow 2013, 12). The range of technological options for communication may contribute to the likelihood and timeliness of home-school-community information exchanges and collaborations.

Examples of technology used to facilitate communication among homes, schools, and communities include the following:

- Digital newsletters (provided in the languages of the homes) that highlight classroom learning experiences and, with permission, include photographs and videos
- Forums on which questions from homes, communities, and schools can be posed and answered
- Classroom Web pages that include classroom news and student work (with permission)
- Online surveys of parents or guardians, students, and communities to determine interests, hopes, and potential contributions to student learning
- Informative classroom blogs, podcasts, vodcasts
- Wikis for collaboration among students, parents or guardians, and community members
- Online gradebooks, accessible by teachers, students, and parents or guardians

Technology provides a promising new form of parent involvement (Zieger and Tan 2012). As they use technology to engage with homes and communities, educators should model responsible, ethical, and secure use of technology. Schools should also recognize that some families may have limited access to technology, and so print versions of information should be made available. Furthermore, schools should give appropriate consideration to the home languages of the families and ensure clear and respectful communication.

Instructional Practices for 21st Century Learning

The Committee on Defining Deeper Learning and 21st Century Skills recommends the following research-based teaching methods to support 21st century learners (National Research Council 2012, 181-182):

- Using multiple and varied representations of concepts and tasks, such as diagrams, animations, and concrete experiences along with text
- Encouraging elaboration, questioning, and explanation, such as prompting students to explain information and arguments as they read
- Engaging learners in challenging tasks while providing supportive guidance and feedback
- Teaching with examples and cases, such as modeling how to prepare a presentation or provide constructive feedback to a student author
- Priming student motivation, such as by connecting topics to students' lives and interests and engaging them in collaborative work
- Using formative assessment

Engagement with literature provides an exceptional vehicle for developing 21st century skills. The CA CCSS for ELA/Literacy and the CA ELD Standards ensure that students engage richly with literary and informational text across the grade span and throughout the curriculum. Figure 10.10 highlights several 21st century skills that can be supported by a variety of instructional experiences with literary and informational text.

Figure 10.10. Selected 21st Century Skills and Literary and Informational Text Experiences

Students develop critical thinking when they

- Synthesize and organize text information
- Examine text closely to interpret information, draw conclusions, and evaluate an author's decisions about content and form
- Closely and critically examine visual aspects of a text, including illustrations, diagrams, and charts, for bias, perspective, aesthetic appeal, and representation
- Identify the author's perspectives, biases, and use of rhetoric
- Generate questions about the content, form, purposes or perspectives of a text
- Communicate with others to understand their points of view, ideas, and interpretations
- Identify real world local and global issues (e.g., social, economic, political, environmental) discussed in literary and informational text

Students develop creative thinking when they

- Develop dramatic, poetic, media, and visual responses to literary and informational text
- Engage in idea-generation activities, such as brainstorming
- Participate in activities that spark their curiosity about text or text topics
- Create presentations to share understandings of text
- Create Facebook pages, blogs, or tweets for characters or historical figures
- Generate research questions and procedures in response to text

Students develop communication and collaboration skills when they

- Present orally or in written, digital or visual form, both informally and formally, their responses to and understandings of a text selection
- Share understandings with one another and build on the ideas and interpretations of others
- Communicate in large and small groups about literary and informational text for a variety of purposes, including to inform, question, clarify, or persuade
- Elaborate on their own and others' ideas about texts
- Plan and organize individual and collaborative presentations to convey or extend text information, ideas, or themes with an audience in mind
- Discuss with peers different interpretations of text and reasons for those interpretations
- Interact in meaningful ways with peers of diverse backgrounds and discuss different and similar perspectives on issues

Students develop social and cross-cultural skills and global competence when they

- Interact with local and distant others to share responses to information, themes, characters, illustrations, and author's choices
- Collaborate with diverse partners to design and develop presentations or projects in response to literature
- Engage with literature that presents a range of world perspectives and experiences
- Respectfully and with an open mind discuss literature with peers from diverse backgrounds
- Capitalize on proficiency in languages other than English to communicate with global peers

Students develop technology skills when they

- Engage with digital and multimedia text
- Engage in additional investigation of topics in a text using technology, such as the Internet
- Use a variety of technologies, such as computers, tablets, projection systems, document cameras, and mp3 players or iPods, to share information from or responses to a text or to learn more about a topic or author
- Examine text carefully to locate and use pertinent information to support a position, justify an interpretation, or make a point

Source

Adapted from

Yopp, Hallie K., and Ruth H. Yopp. 2014. *Literature-Based Reading Activities: Engaging Students in Literary and Informational Text*. 6th ed., 5. Boston: Pearson. Reprinted by permission of Pearson Education, Inc., New York, NY.

Equitable Access

It is critical that all students have access to curricula, instruction, and learning environments that develop their critical and creative thinking, communication and collaboration skills, global competence, and other 21st century skills. Attention to these skills should not be set aside until after students develop proficiency in literacy or with English as an additional language. They are a crucial component of every student's education. Access to technology is highlighted in this section.

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Technology

The term *digital divide* was coined in the 1990s to reference the gap in access to computers and the Internet that separated different demographic and socioeconomic groups in the United States. The concept was popularized by a series of reports conducted by the National Telecommunications and Information Administration called, "Falling through the Net" (NTIA 1995, 1998, 1999, 2000). These reports revealed that rural, socioeconomically disadvantaged, and minority groups tended to have less access to modern information and communication technology and the benefits provided by those connections.

While the gap in access has closed somewhat over the last two decades, U.S. Census data in 2011 reveals that 95.2 percent of individuals in the highest household income bracket had access to the Internet at home, whereas only 50.2 percent of individuals in the lowest household income bracket had access in the home. The percentages of white, Asian, African American, and Hispanic households with Internet access was 81.7 percent; 87.4 percent, 63.2 and 63.0 percent, respectively. Furthermore, there are concerns that populations of color are less likely to be involved with social media and Web 2.0 applications that include rich content and technologies for networking and collaboration online (Payton 2003; Trotter 2007).

Given the overlap between the groups involved in the digital divide and the achievement gap in student performance, it is important that districts, schools, and teachers remain alert to the issue of equitable access to technology.

Given the overlap between the groups involved in the digital divide and the achievement gap in student performance, it is important that districts, schools, and teachers remain alert to the issue of equitable access to technology. While federal grants and other funding have helped balance the technology available in schools (although not entirely), there may still be significant gaps in the technology that students have access to outside of their school environments. Studies have shown that gaps in access to reading material affect outcomes in reading achievement, and gaps in access to technology likely have similar impact upon student success in a 21st century learning environment.

Solutions to address these gaps may include giving students access to computer resources outside of school hours, issuing technology devices to students to take home, and preparing teachers to be aware of these issues and providing them with strategies to address them as part of their professional learning (Davis, Fullerton, Jackson, Pittman, and Sweet 2007). Furthermore, school library hours may be extended to offer students Web access to online library resources. Importantly, schools should have adequate bandwidth and Internet access to serve the needs of students, as well as educators.

Technology can help ensure that all students have access to standards-based academic curricula. Issues of access and equity are discussed in more detail in chapter 9 of this *ELA/ELD Framework*, but the specific capability of technology to support a range of learners is noted here. The discussions that follow are not intended to suggest these are mutually exclusive populations of students.

Accessibility for Students with Disabilities

Assistive technology can be used to help students with disabilities gain access to the core curriculum and participate in activities that might otherwise be difficult or impossible.

Assistive technology can be used to help students with disabilities gain access to the core curriculum and participate in activities that might otherwise be difficult or impossible. According to IDEA, an *assistive technology device* is any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a disability. Assistive technology can also refer to software that assists in differentiating instruction or provides necessary visual and auditory context to academic instruction. The CDE's Clearinghouse for Specialized Media and

Translations produces accessible versions of textbooks, workbooks assessments, and ancillary student instructional materials. Accessible formats include Braille, large print, audio, and digital files ranging from Rich Text Files (RTF), HyperText Markup Language (HTML), Digital Accessible Information System (DAISY), and Portable Document Format (PDF).

English Learners

Technology can be used to support EL students' language and literacy development. For example, software that uses visual cues to assist in the teaching of reading concepts can help students at Emerging levels of English language proficiency gain understanding. In addition, EL students benefit from technology use in classroom learning tasks provided to all students. A 2010 study of one district's Digital Learning Classroom project found that interactive whiteboard technology used in the upper elementary grades increased ELs' achievement in reading and mathematics and helped to close the achievement gap between EL and non-EL students (Lopez 2010).

Advanced Learners

Technology can contribute to a challenging and intellectually engaging educational environment for advanced learners. Computer programs that include self-paced options and allow students to explore advanced concepts can keep a range of learners engaged in the learning process. Technology that facilitates a collaborative learning environment can also help advanced students become involved with their peers' study of reading and writing, a more useful outcome than sending them off to study independently. In addition, technology allows for extraordinary creativity and self-direction.

Computer programs that include self-paced options and allow students to explore advanced concepts can keep a range of learners engaged in the learning process.

Professional Learning and Teacher Support

Professional learning is addressed in chapter 11 of this *ELA/ELD Framework* and so is only briefly noted here. It is critical that teachers be provided excellent professional support as they increasingly integrate 21st century skills into every curricular area. They should be provided opportunities to collaborate in learning and planning through face-to-face interactions or virtual communities of practice. They should share and be provided rich models of effective 21st century instruction and curriculum, engage in thoughtful reflection and critique of lessons, and build on and refine instruction together. Because of the remarkable speed of technological innovation, professional learning should be ongoing. Teachers cannot be expected to use technology wisely and productively with students if they are uncomfortable or unfamiliar with the possibilities that the wide variety of tools provide.

Future Directions

There is a moral imperative to prepare students for the world in which 21st century skills are increasingly central in their ongoing educations, careers, and daily lives. Students need to learn about the uses and possible abuses of technology. In addition, becoming adept in collaborative endeavors with others from wide ranging backgrounds and experiences and being able to engage in independent learning are valued increasingly now and in the future.

The popularity of listening and viewing (such as with podcasts and vodcasts) suggests the need for greater attention to both these skills. Writing and reading need to be adapted to include ways to incorporate multimedia elements in effective ways.

Above all, it is important to instill in students the ability to critically evaluate what they read, hear, and view and to ensure their use of evidence in the arguments they read and formulate.

Above all, it is important to instill in students the ability to critically evaluate what they read, hear, and view and to ensure their use of evidence in the arguments they read and formulate. Critical analysis and evaluation of content is the cachet of the future and one way to help ensure success in college or careers and in civic participation. In addition, teaching students to be independent and flexible learners who can work in groups when necessary, but who are capable of taking action independently, is essential.

The benefit of these efforts is the preparation of students who can contribute to and participate in whatever the future delivers.

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