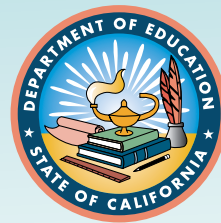


CALIFORNIA

Career Technical Education

Model Curriculum Standards



ADOPTED BY THE CALIFORNIA STATE BOARD OF EDUCATION, JANUARY 2013





CALIFORNIA Career Technical Education

Model Curriculum Standards





Publishing Information

When the *California Career Technical Education Model Curriculum Standards* were adopted by the California State Board of Education (SBE) on January 16, 2013, the members of the SBE were as follows: Michael Kirst, President; Ilene Straus, Vice President; Trish Boyd Williams; Sue Burr; Carl Cohn; Bruce Holaday; Aida Molina; Patricia Ann Rucker; Nicolasa Sandoval; and Josephine Kao, student member.

This publication was edited by John McLean and Faye Ong, working in cooperation with the following staff members from the Career Technical Education and Administration Office of the California Department of Education (CDE): Beverly Campbell, Education Programs Consultant; Carolyn Zachry, Education Programs Consultant; and Russell Weikle, Education Administrator I. The document was prepared for printing by the staff of CDE Press, with the cover and interior design created by Tuyet Truong. It was published by the California Department of Education, 1430 N Street, Sacramento, CA 95814-5901, and distributed under the provisions of the Library Distribution Act and *Government Code* Section 11096.

© 2013 by the California Department of Education
All rights reserved

ISBN: 978-0-8011-1736-7

Ordering Information

Copies of this publication are available for purchase from the California Department of Education. For prices and ordering information, visit <http://www.cde.ca.gov/re/pn/rc/> or call the CDE Press sales office at 1-800-995-4099.

Notice

The guidance in the *California Career Technical Education Model Curriculum Standards* is not binding on local educational agencies or other entities. Except for statutes, regulations, and court decisions referenced herein, the document is exemplary, and compliance with it is not mandatory. (See *Education Code* Section 33308.5.)



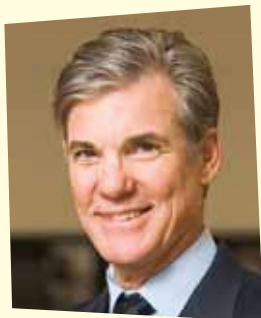
Contents



A Message from the State Superintendent of Public Instruction and the State Board of Education.....	Page ii
Acknowledgments.....	Page iii
Introduction	Page 1
Standards for Career Ready Practice	Page 11
Glossary	Page 13
References.....	Page 16
Industry Sectors	
Agriculture and Natural Resources.....	ANR
Arts, Media, and Entertainment	AME
Building and Construction Trades.....	BCT
Business and Finance.....	BF
Education, Child Development, and Family Services.....	ECDFS
Energy, Environment, and Utilities	EEU
Engineering and Architecture.....	EA
Fashion and Interior Design	FID
Health Science and Medical Technology.....	HSMT
Hospitality, Tourism, and Recreation	HTR
Information and Communication Technologies.....	ICT
Manufacturing and Product Development	MPD
Marketing, Sales, and Services.....	MSS
Public Services.....	PS
Transportation.....	T



A Message from the State Superintendent of Public Instruction and the State Board of Education



California continues to seek opportunities for all students to emerge from school ready to pursue their career and college goals. To that end, a group of respected educators was convened to collaborate with staff members from the California Department of Education (CDE) on *A Blueprint for Great Schools*, a plan that would guide the work of the CDE. The plan states, "Our goals are fitting for the most prosperous state in the wealthiest nation in the world." One goal

is particularly significant for the newly revised California Career Technical Education (CTE) Model Curriculum Standards: "We seek the day when every enterprise in California—public and private—has access to a pool of talent that both attracts the world's leading businesses and hastens the development and success of new ones, creating opportunities for all."

In addition to *A Blueprint for Great Schools* and its goals, an implementation strategy called the California Career Readiness Initiative was put into place. Objective 9 of the Career Readiness Initiative was to "Revise and disseminate CTE Standards aligned with the Common Core: CDE will work with stakeholders in developing the revised standards and present them to the State Board of Education." This directive has been fulfilled with the completion of the new CTE standards. More than 1,000 stakeholders from business, industry, and both postsecondary and secondary education provided input to ensure the updated, research-based CTE standards would be world-class; meet the demands of the twenty-first-century workplace; help students make a smooth transition into colleges and universities; and prepare graduates to successfully compete in the global community.

Organized into California's 15 high-employing industry sectors, the CTE standards are designed to assist schools in developing curriculum and measuring student achievement. Each standard is aligned with one or more Common Core English language arts and mathematics standards, Next Generation Science Core Ideas, and history/social studies standards. This alignment identification will give teachers guidance for integrating instruction, adding application and performance to academic content, engaging more students, and improving outcomes.

California is well known as a leader in the design, development, and implementation of high-quality standards. The new CTE standards continue the state's reputation for cutting-edge work. The standards are important for students, for the economy, and for the overall future of the state. They represent a level of excellence that will serve our students well, helping to prepare them for the successful future they should anticipate.

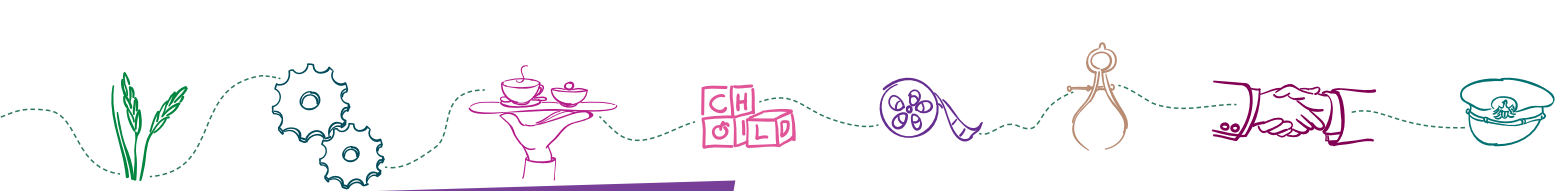
Tom Torlakson

Tom Torlakson
State Superintendent of Public Instruction

Michael W. Kirst

Michael W. Kirst, President
California State Board of Education





Acknowledgments

Under the authority of California *Education Code* Section 51226, State Superintendent of Public Instruction Tom Torlakson approved this revision of the Career Technical Education Model Curriculum Standards. The revision was carried out under the direction of Lupita Cortez Alcalá, Deputy Superintendent of the Instruction and Learning Support Branch at the California Department of Education (CDE), and Patrick Ainsworth, Director of the CDE's Career and College Transition Division. Assistance was provided by the management team led by Russell Weikle, Administrator in the Career Technical Education Administration and Management Office. The team also included Bob Heuvel, Administrator, Agriculture and Home Economics Education Unit; Lloyd McCabe, Administrator, Career Technical Education Leadership and Instructional Support Office; Keith Edmonds, Administrator, High School Innovations and Initiatives Office; and Beverly Campbell and Carolyn Zachry, Education Programs Consultants in the Career Technical Education Administration and Management Office.

The updated standards reflect an extensive volume of research, analysis, writing, and collaboration by the Solano County Office of Education (SCOE), under the direction of Jay Speck, Superintendent of Schools, SCOE; Janet Harden, Assistant Superintendent, Human Resources/Workforce Development; Gillie Miller, Manager, Career Technical Education/Workforce Development; and Christine Long, Instructional Support Services, who processed meeting results and incorporated the many drafts into the final document. Instructors Anna Farina, Doug Green, Beth Traub, Nan Prolo, and Valerie Quijas assisted with academic review, and Joni Ornelas, editor, assisted with the final draft standards review, organization, editing, and formatting.

The design and content of the revised standards were influenced by the input and recommendations of more than 1,000 representatives from business and industry, postsecondary and secondary education, and community members. The CDE wishes to express appreciation for all of the time committed to this important work by the advisers, writing-team members, and those who provided alignment references. The names and affiliations of these individuals are listed in the main body of this document, at the end of each industry-sector component supported by their work.

Numerous hours were contributed by other CDE staff members who selected writers and reviewers, facilitated input and work sessions, and attended to the many details necessary to bring the document to fruition. These industry-sector leads are acknowledged as follows:



Hugh Mooney, Education Programs Consultant—Agriculture and Natural Resources

Jack Mitchell, Education Programs Consultant—Arts, Media, and Entertainment

John Dunn, Education Programs Consultant—Building and Construction Trades and Engineering and Architecture

Mindi Yates, Education Programs Consultant—Business and Finance and Energy, Environment, and Utilities

Angie Ford, Education Programs Consultant—Education, Child Development, and Family Services

Melissa Webb, Education Programs Consultant—Fashion and Interior Design

Cindy Beck, Education Programs Consultant—Health Science and Medical Technology and Public Services

Tanya Wright, Education Programs Consultant—Hospitality, Tourism, and Recreation

Gary Page, Education Programs Consultant—Information and Communication Technologies

Michelle Oliveira, Education Programs Consultant—Manufacturing and Product Development

Kay Ferrier, Education Programs Consultant—Marketing, Sales, and Services

Dara Dubois, Education Programs Consultant—Transportation

The CDE also wishes to recognize the contributions of Karen Shores, Administrator in the CDE's Science, Technology, Engineering, and Mathematics Office; CDE Education Programs Consultants Anne Stephens, Tony Quirarte, Matthew Parsons, and Laura Watson, who provided core curriculum standards alignment validation; Samuel Lee, Associate Information Systems Analyst, who assisted with Web posting and related functions; and John Merris-Coots, California Career Resource Network, Kimberly Born, Work Experience Education (WEE) program, and Erle Hall, Education Programs Assistant, for offering advice and recommendations as the project proceeded.



Introduction

The Career Technical Education (CTE) Model Curriculum Standards are designed to assist California districts and schools in developing high-quality curriculum and instruction to help ensure that students are career and college ready and to prepare them for future careers. The model standards were created with assistance from more than 300 representatives from business, industry, postsecondary, and secondary education and were reviewed by approximately 1,000 individuals, including members of the general public. The standards are rigorous, evidence-based, relevant, and reasonable in scope. They offer clear guidelines for course content development and expectations for student achievement.

Authority

California *Education Code (EC)* Section 51226 requires the State Superintendent of Public Instruction to coordinate the development, on a cyclical basis, of model curriculum standards mandated by EC 51225.3 (requirements for high school graduation) and for a career technical education course of study necessary to assist school districts in complying with EC 51228 (b), which states:

Each school district maintaining any of grades 7 to 12, inclusive, shall offer to all otherwise qualified pupils in those grades a course of study that provides an opportunity for those pupils to attain entry-level employment skills in business or industry upon graduation from high school. Districts are encouraged to provide all pupils with a rigorous academic curriculum that integrates academic and career skills, incorporates applied learning in all disciplines, and prepares all pupils for high school graduation and career entry.*

Given the state's adoption of Common Core State Standards (CCSS) for English language arts and mathematics, as well as changes that have occurred in the U.S. economy since 2005, it was determined that a revision of the CTE standards was necessary to align CTE programs with the CCSS standards and current economic conditions.

The *2008–2012 California State Plan for Career Technical Education* (WestEd et al. 2008), approved by the State Board of Education in March 2008, provides guidance for California's CTE programs. The state plan asserts that "CTE programs are dynamic; curricula need to stay current with rapid changes in the workplace, requiring ongoing updates and learning on the part of CTE faculty" (WestEd et al. 2008, p. 62). The revised CTE standards will help CTE programs keep pace with the new economic and educational opportunities in California.

* The complete *Education Code* is available online at <http://www.leginfo.ca.gov/calaw.html>.



Research-Based Standards

California's first CTE Model Curriculum Standards were adopted by the State Board of Education (SBE) in May 2005. John Kendall and Robert Marzano of the Mid-continent Research for Education and Learning (McREL) developed the research-based model that was used to format the 2005 version of the standards. The revised CTE Model Curriculum Standards expand the research base that was used to shape the original standards. The additional research includes "Depth of Knowledge" levels developed by the Wisconsin Center for Education Research (WCER), the "Rigor/Relevance Framework" from the International Center for Leadership in Education, and "A Model of Learning Objectives" based on *A Taxonomy for Learning, Teaching, and Assessing* (Anderson et al. 2001) and developed by the Center for Excellence in Learning and Teaching at Iowa State University. These concepts were incorporated into the Beyond Knowledge Construct that was used to guide the development of the new standards. The Beyond Knowledge Construct demonstrates the value of adding the CTE Performance dimension to the Cognitive dimension, based on the Depth of Knowledge levels and revised Bloom's Taxonomy (see figure 1). This construct includes sample listings of action verbs used to write the new CTE standards.



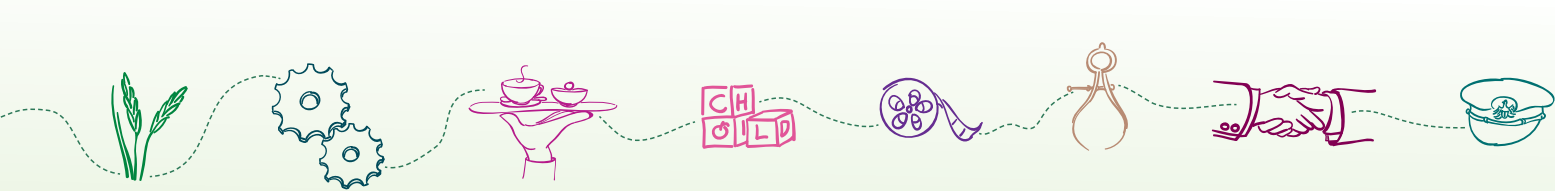


Figure 1

Beyond Knowledge Construct*

KNOWLEDGE

Metacognitive
(form a coherent whole)

Procedural
(how parts relate, find coherence)

Conceptual
(clarify, give examples)

Factual
(recognize, recall, locate)

Use
one-step process to solve a routine problem

Apply
multistep process to solve routine problems

Solve
nonroutine problems using multiple steps

Create
solutions to complex, nonroutine, real-world problems using multiple steps

PERFORMANCE

Factual

Access
Define
Describe
Find
Identify
Label
List
Locate
Match
Name
Recall
Recite
Recognize
Remember
Retrieve
Select
State

Conceptual

Adhere
Apply
Classify
Communicate
Compare
Demonstrate
Develop
Discriminate
Employ
Explain
Implement
Infer
Interpret
Maintain
Organize
Participate
Practice
Promote
Summarize
Transfer
Understand
Use

Procedural

Analyze
Assess
Comply
Compare
Contrast
Deconstruct
Deduce
Defend
Detect
Diagram
Differentiate
Discern
Distinguish
Enhance
Evaluate
Experiment
Explore
Illustrate
Integrate
Research
Solve

Metacognitive

Advocate
Build
Compile
Compose
Construct
Create
Design
Devise
Formulate
Invent
Plan
Predict
Produce
Reconstruct
Reorganize
Synthesize

*Developed by Russell Weikle and Beverly Campbell of the California Department of Education.



Organization and Content

The CTE Model Curriculum Standards publication is organized for use as a complete document or for access to individual industry sectors and pathways. The document includes Standards for Career Ready Practice, which describe knowledge and skills that students need prior to entering a career technical education program, as part of the career technical education sequence, or as integrated elements of other coursework in preparation for careers and college.

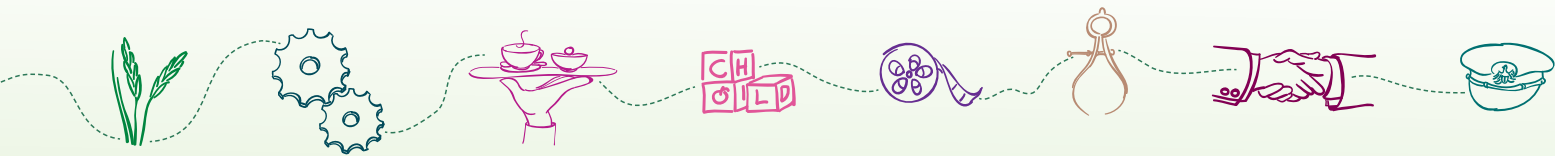
Each of the 15 industry sector sections includes a description, anchor standards, pathway standards, and an academic alignment matrix. The standards can be adjusted to be part of the curriculum (grades seven through twelve), provided through adult education, or included in community college programs. The document also lists the representatives who participated in each sector's content development and the references that were consulted to revise the CTE standards.

Standards for Career Ready Practice

California's Standards for Career Ready Practice, which follow this introduction, are based on the Career Ready Practices of the Common Career Technical Core (CCTC), a state-led initiative sponsored by the National Association of State Directors of Career Technical Education Consortium (NASDCTEc):

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study. (NASDCTEc 2012, p. 2)

California's 12 Standards for Career Ready Practice align with the state's CTE anchor standards and reflect the expectations from business and industry, labor and community organizations, and secondary and postsecondary education representatives from 42 participating states.



Anchor Standards

The 11 anchor standards build on the Standards for Career Ready Practice and are common across the 15 industry sectors. Content for these standards was drawn from several documents: "Preparing Students for the 21st Century Economy" (American Association of Colleges for Teacher Education and the Partnership for 21st Century Skills 2010); *How Should Colleges Prepare Students to Succeed in Today's Global Economy?* (American Association of Colleges and Universities and Peter D. Hart Research Associates, Inc. 2006); "Importance of Skills and Knowledge for College and Career Readiness," from *The MetLife Survey of The American Teacher: Preparing Students for College and Careers* (MetLife, Inc. 2011); and *Are They Really Ready to Work? Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce* (The Conference Board et al. 2006).

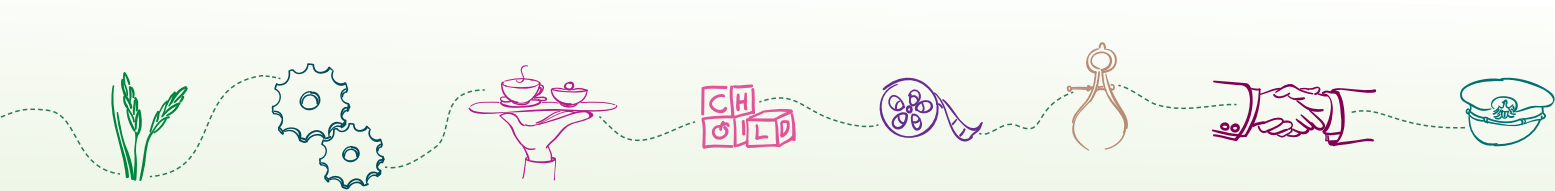
Each anchor standard is followed by performance indicators using action verbs from the Beyond Knowledge Construct, presented in a hierarchical progression of simple tasks to more complex tasks. Performance indicators provide guidance for curriculum design and standards measurement. The industry-sector anchor standards have been customized with selected additions to better reflect the needs and special conditions of each industry sector.

Anchor Standard 1 (Academics) guides users to sector-specific core academic standards related to each industry sector, which are listed in the alignment matrix at the end of each sector section. Anchor standards 2–10 are deliberately aligned with one of the Common Core English language arts standards, using similar language demonstrating the natural connections between the two subjects (see table 1). Anchor Standard 11 (Demonstration and Application) highlights classroom, laboratory, and workplace learning specific to the individual sector and pathways.



Table 1: CTE Anchor Standards—Common Core English Language Arts Alignment

ANCHOR STANDARD	CCSS ELA Standards Code(s)
<p>Anchor Standard 1: Academics Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the industry sector alignment matrix for identification of standards.</p>	<p>Note: alignment listed within each sector</p>
<p>Anchor Standard 2: Communications Language Standard: Acquire and accurately use general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the (career and college) readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.</p>	<p>LS 9-10, 11-12.6</p>
<p>Anchor Standard 3: Career Planning and Management Speaking and Listening Standard: 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.</p>	<p>SLS 11-12.2</p>
<p>Anchor Standard 4: Technology Writing Standard: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments and information.</p>	<p>WS 11-12.6</p>
<p>Anchor Standard 5: Problem Solving and Critical Thinking Writing Standard: Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem, narrow or broaden the inquiry when appropriate, and synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>	<p>WS 11-12.7</p>
<p>Anchor Standard 6: Health and Safety Reading Standards for Science and Technical Subjects: Determine the meaning of symbols, key words, and other domain-specific words and phrases as they are used in a specific scientific or technical context.</p>	<p>RSTS 9-10 11-12.4</p>
<p>Anchor Standard 7: Responsibility and Flexibility Speaking and Listening Standard: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners, building on others' ideas and expressing their own clearly and persuasively.</p>	<p>SLS 9-10 11-12.1</p>
<p>Anchor Standard 8: Ethics and Legal Responsibilities Speaking and Listening Standard: Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the work.</p>	<p>SLS 11-12.1d</p>
<p>Anchor Standard 9: Leadership and Teamwork Speaking and Listening Standard: Work with peers to promote civil, democratic discussions and decision making; set clear goals and deadlines; and establish individual roles as needed.</p>	<p>SLS 11-12.1b</p>
<p>Anchor Standard 10: Technical Knowledge and Skills Writing Standard: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.</p>	<p>WS 11-12.6</p>
<p>Anchor Standard 11: Demonstration and Application Demonstrate and apply the knowledge and skills contained in the industry-sector anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and the career technical student organization.</p>	<p>Note: no alignment evident for this standard</p>



Pathway Standards

Each of the 15 industry sectors (see table 2) contain from three to seven pathways. To be identified and listed for an industry sector, each pathway had to meet the following criteria:

- unique to an industry sector
- has an occupational focus
- consistent in size and scope
- composed of similar functions
- inclusive of all aspects of the industry
- includes 8–12 pathway-specific standards
- demonstrates sequence potential
- reasonable and appropriate for high school
- leads to high-skill, high-wage, or high-demand jobs
- sustainable and viable over the next 10 years

Table 2: Industry Sectors and Pathways

INDUSTRY SECTOR	PATHWAYS
Agriculture and Natural Resources	<ul style="list-style-type: none"> • Agricultural Business • Agricultural Mechanics • Agriscience • Animal Science • Forestry and Natural Resources • Ornamental Horticulture • Plant and Soil Science
Arts, Media, and Entertainment	<ul style="list-style-type: none"> • Design, Visual, and Media Arts • Performing Arts • Production and Managerial Arts • Game Design and Integration
Building and Construction Trades	<ul style="list-style-type: none"> • Cabinetry, Millwork, and Woodworking • Engineering and Heavy Construction • Mechanical Systems Installation and Repair • Residential and Commercial Construction
Business and Finance	<ul style="list-style-type: none"> • Business Management • Financial Services • International Business
Education, Child Development, and Family Services	<ul style="list-style-type: none"> • Child Development • Consumer Services • Education • Family and Human Services
Energy, Environment, and Utilities	<ul style="list-style-type: none"> • Energy and Power Technology • Environmental Resources • Telecommunications
Engineering and Architecture	<ul style="list-style-type: none"> • Architectural Design • Engineering Technology • Engineering Design • Environmental Engineering



Fashion and Interior Design	<ul style="list-style-type: none"> • Fashion Design and Merchandising • Interior Design • Personal Services
Health Science and Medical Technology	<ul style="list-style-type: none"> • Biotechnology • Patient Care • Health Care Administrative Services • Health Care Operational Support Services • Public and Community Health • Mental and Behavioral Health
Hospitality, Tourism, and Recreation	<ul style="list-style-type: none"> • Food Science, Dietetics, and Nutrition • Food Service and Hospitality • Hospitality, Tourism, and Recreation
Information and Communication Technologies	<ul style="list-style-type: none"> • Information Support and Services • Networking • Software and Systems Development • Games and Simulation
Manufacturing and Product Development	<ul style="list-style-type: none"> • Graphic Production Technologies • Machining and Forming Technologies • Welding and Materials Joining • Product Innovation and Design
Marketing, Sales, and Services	<ul style="list-style-type: none"> • Marketing • Professional Sales • Entrepreneurship/Self-Employment
Public Services	<ul style="list-style-type: none"> • Public Safety • Emergency Response • Legal Practices
Transportation	<ul style="list-style-type: none"> • Operations • Structural Repair and Refinishing • Systems Diagnostics, Service, and Repair

Academic Alignment Matrix

Each sector includes an academic alignment matrix that displays where a natural, obvious alignment occurs. Compiled by five teams of academic content experts in collaboration with industry-sector consultants, teachers, and other advisers, the alignment was selected if it was determined that the pathway standard would enhance, reinforce, or provide an application for a specific academic subject standard.

The alignment matrices include the subjects of Common Core English language arts and mathematics standards, history/social studies standards, and Next Generation Science Core Ideas. To assist with further review and implementation, each academic alignment is notated with specific pathway standards codes (see figure 2).

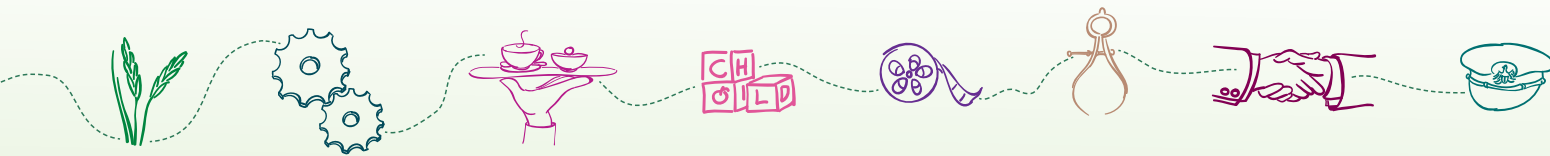


Figure 2: Sample Academic Alignment Matrix

Education, Child Development, and Family Services	A. Child Development	B. Consumer Services
ENGLISH LANGUAGE ARTS		
Language Standards – LS (Standard Area, Grade Level, Standard #)		
11-12.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.	A1.0, A2.0, A3.0, A4.0, A5.0, A6.0, A7.0, A8.0, A9.0, A10.0, A11.0, A12.0	B1.0, B2.0, B3.0, B4.0, B5.0, B6.0, B7.0, B8.0, B9.0, B10.0, B11.0

For example, Language Standard 11-12.1 is aligned with Child Development pathway standard A10.0 (*Communicate and interact effectively with families and communities*) and Consumer Services pathway B8.0 (*Use the skills and techniques needed to prepare advertising, public relations, and informational materials for consumers*).

Implementation

The Standards for Career Ready Practice can be integrated with a course or incorporated into several courses over multiple school years (grades seven through twelve). The practices are expectations for all students, whether they are enrolled in a CTE program or following a more generalized course sequence. It is expected that all students who exit high school will be proficient in these practices.

The anchor standards are the basis for each of the pathways within each sector. These standards are designed to assist with the development of course curricula and instructional lesson plans; they describe what is to be taught and measured. In most cases, the teacher determines the sequence and strategies to be used to meet the needs of the student population he or she is serving.

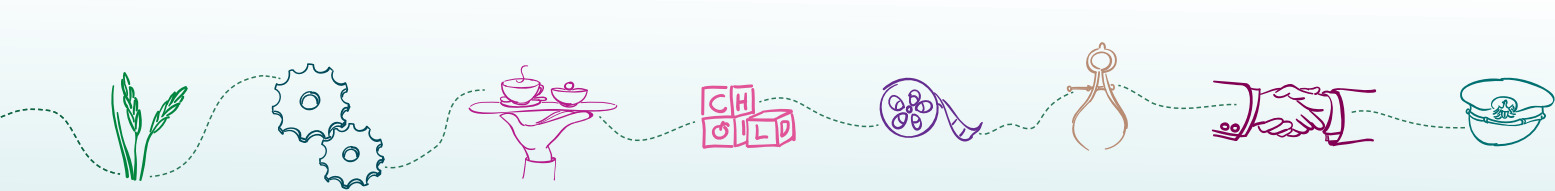
The performance indicators that follow each standard offer guidance for both course design and student assessment. They are intended to guide coursework as it is developed. The pathways organize the standards with a career focus, but they are not designed to be offered as single courses. Rather, the standards from each pathway are collected and organized into a sequence of learning. To meet local demands of business and industry and particular student populations, standards can be collected from more than one sector to create a course.

Using the academic alignment matrices as a resource, academic and CTE teachers can see where enhancements and support for both sets of standards can be initiated. CTE teachers can quickly identify academic standards that have a substantial relationship to their instruction. Likewise, academic teachers can specify individual academic standards and quickly identify related CTE standards, which will assist them in incorporating application and technology in their curricula and lessons.



The *Career Technical Education Framework for California Public Schools* (CDE 2007) provides specific guidance and tools for designing CTE courses, curricula, lessons, and assessments. The framework can be of great assistance in developing high-quality CTE programs and developing curricula that integrate career and academic learning for improving student achievement. The CTE framework will be revised in 2014 to reflect the updated CTE standards; however, the concepts in the 2007 framework remain relevant and are supportive of rigorous instruction.

The CTE Model Curriculum Standards are intended to serve the entire education community—from middle schools and high schools to postsecondary colleges and career training programs. A major aim of these standards is to prepare students for postsecondary education and training and to help them make a smooth transition into the workforce. In order for both the people and the economy of California to prosper, it is essential for all students to emerge from schools ready to pursue their career and college goals. Equipping all high school students with the knowledge and skills necessary to plan and manage their education and careers throughout their lives will help to guarantee these important outcomes. Strong CTE programs will continue to provide important educational opportunities to assist students as they pursue their dreams and strive for economic prosperity. The CTE Model Curriculum Standards are a resource for educators and the business world for ensuring high-quality CTE learning experiences and improved student outcomes in the twenty-first-century economy.



Standards for Career Ready Practice[†]

Standards for Career Ready Practice describe the fundamental knowledge and skills that students need to prepare for transition to postsecondary education, career training, or the workforce. These standards are not exclusive to a career pathway, a CTE program of study, a particular discipline, or level of education. Standards for Career Ready Practice are taught and reinforced in all career exploration and preparation programs or integrated into core curriculum, with increasingly higher levels of complexity and expectation as a student advances through a program of study. Standards for Career Ready Practice are a valuable resource for CTE and academic teachers in the design of curricula and lessons that teach and reinforce the career-ready aims of the CTE Model Curriculum Standards and the Common Core State Standards.

1. Apply appropriate technical skills and academic knowledge.

Career-ready individuals readily access and use the knowledge and skills acquired through experience and education. They make connections between abstract concepts with real-world applications and recognize the value of academic preparation for solving problems, communicating with others, calculating measures, and performing other work-related practices.

2. Communicate clearly, effectively, and with reason.

Career-ready individuals communicate thoughts, ideas, and action plans with clarity, using written, verbal, electronic, and/or visual methods. They are skilled at interacting with others: they are active listeners who speak clearly and with purpose, and they are comfortable with terminology that is common to workplace environments. Career-ready individuals consider the audience for their communication and prepare accordingly to ensure the desired outcome.

3. Develop an education and career plan aligned with personal goals.

Career-ready individuals take personal ownership of their educational and career goals and manage their individual plan to attain these goals. They recognize the value of each step in the educational and experiential process, and they understand that nearly all career paths require ongoing education and experience to adapt to practices, procedures, and expectations of an ever-changing work environment. They seek counselors, mentors, and other experts to assist in the planning and execution of education and career plans.

4. Apply technology to enhance productivity.

Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring and using new technology. They understand the inherent risks—personal and organizational—of technology applications, and they take actions to prevent or mitigate these risks.

5. Utilize critical thinking to make sense of problems and persevere in solving them.

Career-ready individuals recognize problems in the workplace, understand the nature of the problems, and devise effective plans to solve the problems. They thoughtfully investigate the root cause of a problem prior to introducing solutions. They carefully consider options to solve a problem and, once agreed upon, follow through to ensure the problem is resolved.

[†]Adapted for California and based on the "Career Ready Practices" adopted by the Common Career Technical Core (CCTC). The CCTC practices are posted at <http://www.careertech.org/>.



6. Practice personal health and understand financial literacy.

Career-ready individuals understand the relationship between personal health and workplace performance. They contribute to their personal well-being through a healthy diet, regular exercise, and mental health activities. Career-ready individuals also understand that financial literacy leads to a secure future that enables career success.

7. Act as a responsible citizen in the workplace and the community.

Career-ready individuals understand the obligations and responsibilities of being a member of a community and demonstrate this understanding every day through their interactions with others. They are aware of the impacts of their decisions on others and the environment around them, and they think about the short-term and long-term consequences of their actions. They are reliable and consistent in going beyond minimum expectations and in participating in activities that serve the greater good.

8. Model integrity, ethical leadership, and effective management.

Career-ready individuals consistently act in ways that align with personal and community-held ideals and principles. They employ ethical behaviors and actions that positively influence others. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the direction and actions of a team or organization, and they recognize the short-term and long-term effects that management's actions and attitudes can have on productivity, morale, and organizational culture.

9. Work productively in teams while integrating cultural and global competence.

Career-ready individuals contribute positively to every team, as both team leaders and team members. To avoid barriers to productive and positive interaction, they apply an awareness of cultural differences. They interact effectively and sensitively with all members of the team and find ways to increase the engagement and contribution of other members.

10. 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.

11. Employ valid and reliable research strategies.

Career-ready individuals employ research practices to plan and carry out investigations, create solutions, and keep abreast of the most current findings related to workplace environments and practices. They use a reliable research process to search for new information and confirm the validity of sources when considering the use and adoption of external information or practices.

12. Understand the environmental, social, and economic impacts of decisions.

Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact other people, organizations, the workplace, and the environment. They are aware of and utilize new technologies, understandings, procedures, and materials and adhere to regulations affecting the nature of their work. They are cognizant of impacts on the social condition, environment, workplace, and profitability of the organization.



Glossary

academic alignment

The connection between career technical education (CTE) standards and core curriculum standards. The alignment is intended to show how CTE standards can enhance, reinforce, or provide an application for a specific academic subject standard.

academic alignment matrix

A table provided for each CTE industry sector that displays where natural, obvious academic alignment occurs. Each matrix includes the subjects of Common Core English language arts and mathematics, history/social studies, and Next Generation Science Core Ideas.

anchor standards

Standards that are common across all industry sectors, built on Career Ready Practices, and repeated with more specificity within the industry sector pathways. The anchor standards show deliberate alignment with selected Common Core English language arts standards.

Beyond Knowledge Construct

Demonstrates the value of adding the CTE performance dimension to the cognitive dimension. The construct is based on the Depth of Knowledge levels, revised Bloom's Taxonomy, and the Rigor/Relevance Framework and includes sample listings of action verbs used to revise California's CTE Model Curriculum Standards.

Bloom's Taxonomy (revised)

Categorizes the cognitive skills required of the brain to perform a task, describing the types of thinking processes necessary to answer a question.

career pathway

A pathway that is unique to an industry sector, has an occupational focus, consists of similar functions, includes standards that demonstrate sequence potential, and is reasonable and appropriate for high school students.

career technical education (CTE)

An educational strategy designed to prepare students for ongoing education, long-term careers, citizenship, and entry into the workplace. CTE responds to the needs of the economy with regard to both industry focus and skills that are taught.



Common Core State Standards (CCSS) Nationally focused academic standards that were adopted by California in 2010 (and by 44 other states as of December 2012). The CCSS for English language arts and mathematics provide the same standards for all students, allowing them to receive a good education even if they change schools or move to a different state. Teachers, parents, and education experts designed the CCSS to prepare students for both college and the workplace.

Depth of Knowledge An important perspective on cognitive knowledge that requires states to rethink the meaning of test alignment to include both the content assessed in a test item and the extent (or “depth”) to which we expect students to demonstrate understanding of the content.

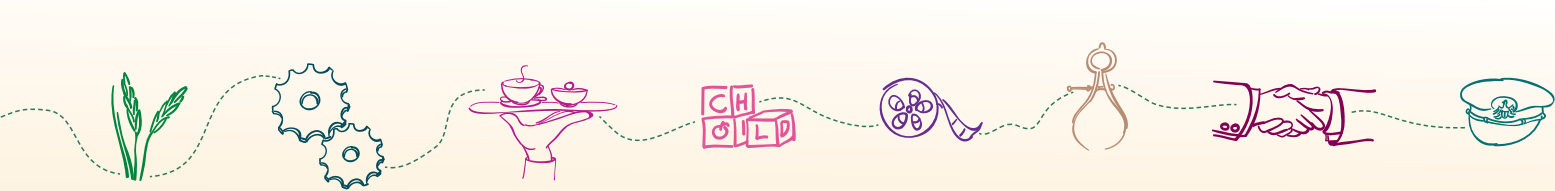
industry sector A group of companies that operate in the same segment of the economy and share a common business, business activities, or characteristics. The 15 industry sector groups organize CTE programs to align with California's top-emplying business segments.

integrated curriculum A blend of standards and content from two or more core academic subjects, with CTE content bringing relevance and providing applications that add meaning to subjects that can be abstract.

model curriculum standards Essential knowledge and skills that students are expected to master upon completion of curriculum designed by local schools and districts.

pathway standards Standards that determine what students need to know and be able to do to prepare for career entry or progression into a postsecondary program. Each career pathway consists of 8–12 standards, with accompanying performance indicators that add detail for curriculum design.

performance indicators Indicators that further define pathway standards, providing guidance for curriculum design and measurement of standards achievement.



Rigor/Relevance Framework

A tool developed by the International Center for Leadership in Education that blends knowledge and application in a matrix format. The framework offers instructional guidance that aims to strengthen student achievement.

sequence of learning

The organization of standards into a logical sequence of coursework that begins with more general content and gradually increases to include career-specific content.

Standards for Career Ready Practice

Standards that all students are expected to master prior to completing high school. They reflect the level of preparation expected by business and industry, labor, community agencies and organizations, and postsecondary educational entities.

work-based learning

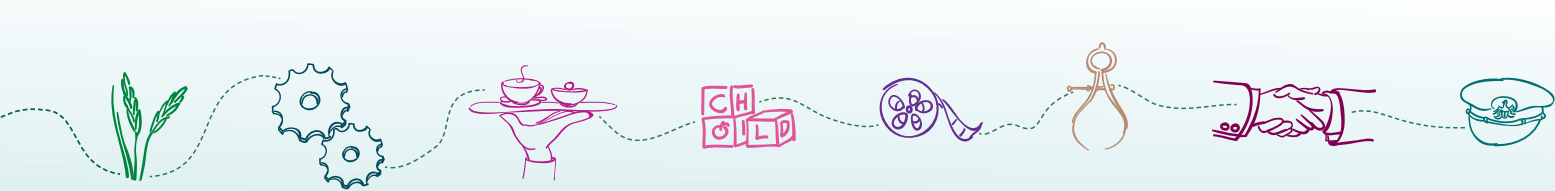
An education strategy that links classroom instruction to work-related experiences, aims to increase students' technical skills and knowledge, and helps shape career decision making. Work-based learning is offered on campuses or in community locations and includes explorations, job shadowing, simulations, student-led enterprise, service learning, community classroom or cooperative education, internships, and apprenticeships.





References

- ACT. 2010. *A First Look at the Common Core and College and Career Readiness*. <http://www.act.org/research/policymakers/pdf/FirstLook.pdf> (accessed December 4, 2012).
- American Association of Colleges for Teacher Education (AACTE) and the Partnership for 21st Century Skills. 2010. "Preparing Students for the 21st Century Economy." <http://www.edsynergy.org/wp-content/uploads/2011/07/PREPARING-STUDENTS-FOR-THE-21ST-CENTURY-ECONOMY-3.doc> (accessed December 4, 2012).
- Anderson, Lorin W., David R. Krathwohl, Peter W. Airasian, Kathleen A. Cruikshank, Richard E. Mayer, Paul R. Pintrich, James Rahts, and Merlin C. Wittrock. 2001. *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. New York: Pearson.
- Association of American Colleges and Universities. 2007. *College Learning for the New Global Century*. http://www.aacu.org/advocacy/leap/documents/GlobalCentury_final.pdf (accessed December 4, 2012).
- Association of American Colleges and Universities and Peter D. Hart Research Associates, Inc. 2006. *How Should Colleges Prepare Students to Succeed in Today's Global Economy?* <http://www.aacu.org/leap/documents/Re8097abcombined.pdf> (accessed December 4, 2012).
- California Department of Education. 2006. *California Career Technical Education Model Curriculum Standards, Grades Seven Through Twelve*. <http://www.cde.ca.gov/ci/ct/sf/documents/ctestandards.pdf> (accessed December 4, 2012).
- . 2007. *Career Technical Education Framework for California Public Schools, Grades Seven Through Twelve*. <http://www.cde.ca.gov/ci/ct/sf/documents/cteframework.pdf> (accessed December 4, 2012).
- California Employment Development Department. 2010. *California's Green Economy: Summary of Survey Results*. <http://www.labormarketinfo.edd.ca.gov/contentpub/GreenDigest/CA-Green-Economy-SummarySurveyResults.pdf> (accessed December 4, 2012).
- Children Now. 2010. *California Report Card 2011–12: Setting the Agenda for Children*. http://www.childrennow.org/uploads/documents/reportcard_2011.pdf (accessed December 4, 2012).
- The Conference Board, Partnership for 21st Century Skills, Corporate Voices for Working Families, and the Society for Human Resource Management. 2006. *Are They Really Ready to Work? Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce*. http://www.shrm.org/research/surveyfindings/documents/are_they_really_ready_to_work_survey_report.pdf (accessed December 4, 2012).



- Conley, David T. 2010. *College and Career Ready: Helping All Students Succeed Beyond High School*. San Francisco: Jossey-Bass.
- Conley, David T., Kathryn V. Drummond, Alicia de Gonzalez, Jennifer Rooseboom, and Odile Stout. 2011. *Reaching the Goal: The Applicability and Importance of the Common Core State Standards to College and Career Readiness*. Eugene, OR: Educational Policy Improvement Center. <http://www.epiconline.org/publications/documents/ReachingtheGoal-FullReport.pdf> (accessed December 4, 2012).
- Darling-Hammond, Linda, Ruth Chung Wei, Alethea Andree, Nikole Richardson, and Stelios Orphanos. 2009. *Professional Learning in the Learning Profession: A Status Report on Teacher Development in the United States and Abroad*. Palo Alto, CA: National Staff Development Council and the School Redesign Network at Stanford University. <http://learningforward.org/docs/pdf/nsdcstudy2009.pdf> (accessed December 4, 2012).
- Institute of Education Sciences, National Center for Education Statistics. 2012. *The Condition of Education*. <http://nces.ed.gov/programs/coe/> (accessed December 4, 2012).
- International Center for Leadership in Education. 2012. "Rigor/Relevance Framework." Rexford, NY. <http://www.leadered.com/rrr.html> (accessed December 4, 2012).
- Intersegmental Committee of the Academic Senates (ICAS) of the California Community Colleges. 2002. *Academic Literacy: A Statement of Competencies Expected of Students Entering California's Public Colleges and Universities*. <http://asccc.org/sites/default/files/AcademicLiteracy.pdf> (accessed December 4, 2012).
- Kober, Nancy, and Diane Stark Rentner. 2011. *States' Progress and Challenges in Implementing Common Core State Standards*. Washington, DC: Center on Education Policy. <http://www.cep-dc.org/displayDocument.cfm?DocumentID=343> (accessed December 4, 2012).
- Marzano, Robert J., and John S. Kendall. 2007. *The New Taxonomy of Educational Objectives*. 2nd ed. Thousand Oaks, CA: Corwin Press. <http://www.marzanoresearch.com/site/default.aspx> (accessed December 4, 2012).
- MetLife, Inc. 2011. *The MetLife Survey of the American Teacher: Preparing Students for College and Careers*. https://www.metlife.com/assets/cao/contributions/foundation/american-teacher/MetLife_Teacher_Survey_2010.pdf (accessed December 6, 2012).
- National Association of State Directors of Career Technical Education Consortium (NASDCTEc). 2011. "CTE and College and Career Ready Standards: Preparing Students for Further Education and Careers." Silver Spring, MD. <http://www.careertech.org/> (accessed December 4, 2012).



———. 2012. "Introduction to the Common Career Technical Core."

National Center for Education Statistics. 2008. *Trends in International Mathematics and Science Study 2007*. <http://nces.ed.gov/timss/index.asp> (accessed December 4, 2012).

National Governors Association, Council of Chief State School Officers, and Achieve, Inc. 2008. *Benchmarking for Success: Ensuring U.S. Students Receive a World-Class Education*. Washington, DC: National Governors Association. <http://www.nga.org/files/live/sites/NGA/files/pdf/0812BENCHMARKING.PDF> (accessed December 4, 2012).

Organisation for Economic Co-operation and Development (OECD). 2011. *Strong Performers and Successful Reformers in Education: Lessons from PISA for the United States*. Paris, France. <http://www.oecd.org/pisa/46623978.pdf> (accessed December 4, 2012).

Owen Wilson, Leslie. 2006. "Dr. Leslie Owen Wilson's Curriculum Pages: Beyond Bloom—A New Version of the Cognitive Taxonomy." Stevens Point, WI: University of Wisconsin–Stevens Point. <http://www4.uwsp.edu/education/lwilson/curric/newtaxonomy.htm> (accessed December 4, 2012).

Public Broadcasting Service (PBS). 2012. PBS TeacherLine: Professional development for PreK–12 educators. <http://www.pbs.org/teacherline> (accessed December 4, 2012).

United States Department of Labor, Employment and Training Administration. 2009. "Secretary's Commission on Achieving Necessary Skills." <http://wdr.doleta.gov/SCANS/> (accessed December 4, 2012).

WestEd, the California Department of Education, and the California Community Colleges Chancellor's Office. 2008. *2008–2012 California State Plan for Career Technical Education*. http://www.schoolsmovingup.net/cte/downloads/cteplan_122808.pdf (accessed December 5, 2012).





CALIFORNIA

Career Technical Education Model Curriculum Standards

<http://www.cde.ca.gov/ci/ct/sf/ctemcstandards.asp>

