real world, HANDS-ON & integrated

Exploring facilities for STEAM and Career Technical Education

ASSOCIATION FOR LEARNING ENVIRONMENTS
Enhancing the Educational Experience
Northern California / Nevada Chapter
formerly cefpi

Introductions

Laura Knauss, AIA, ALEP, LEED AP

Principal, Lionakis

Kathleen Moore, ALEP

Kathleen Moore & Associates

Bill Heinicke, ALEP, LEED AP

Director of Planning, Elk Grove Unified School District

Why CTE?

"**All estimates suggest that participation in a high-quality CTE program boosts the probability of on-time graduation from high school by 7 to 10 percentage points for higher income students**, and suggestively larger effects for their lower-income peers and students on the margin of being admitted to oversubscribed schools. This work informs an understanding of the potential impact of specific CTE program participation on the accumulation of human capital even in a high-stakes policy environment."

The Effect of Career and Technical Education on Human Capital Accumulation: Causal Evidence from Massachusetts
- Shaun M. Dougherty

"CTE helps prepare young people for success in both postsecondary education and a range of high-wage, high-skill careers and is a critical engine for our economy. **Students concentrating in CTE programs graduate high school at higher rates (93%, compared to an average national freshman graduation rate of 80%) and succeed at higher rates in postsecondary education**. These courses also provide a high return on taxpayers' investments, netting the economy at least twice as much in benefits as the students' training cost."

Perkins Reauthorization: An Opportunity to Address Career and Technical Education Teacher Shortages
- Jessica Cardichon

Not Your Mother's Home Economics…

"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."

- Tom Torlakson, State Superintendent of Public

California's Career Technical Education:

Preparing Students for the 21st Century and Beyond

"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."

—Jean Ishibashi, State Superintendent of Public Instruction

INDUSTRY SECTORS

Agriculture and Natural Resources
- Agricultural Business
- Agricultural Mechanics
- Agriscience
- Animal Science
- Forestry and Natural Resources
- Ornamental Horticulture
- Plant and Soil Science

Arts, Media, and Entertainment
- Design, Visual, and Media Arts
- Performing Arts
- Production and Managerial Arts
- Game Design and Integration

Building and Construction Trades
- Cabinetry, Millwork, and Woodworking
- Engineering and Heavy Construction
- Mechanical Systems Installation and Repair
- Residential and Commercial Construction

Business and Finance
- Business Management
- Financial Services
- International Business

Education, Child Development, and Family Services
- Child Development
- Consumer Services
- Education
- Family and Human Services

Energy, Environment, and Utilities
- Environmental Resources
- Energy and Power Technology
- Telecommunications

Engineering and Architecture
- Architectural Design
- Engineering Technology
- Engineering Design
- Environmental Engineering

Fashion and Interior Design
- Fashion Design and Merchandising
- Interior Design
- Personal Services

Health Science and Medical Technology
- Biotechnology
- Patient Care
- Health Care Administrative Services
- Health Care Operational Support Services
- Public and Community Health
- Mental and Behavioral Health

Hospitality, Tourism, and Recreation
- Food Science, Dietetics, and Nutrition
- Food Service and Hospitality
- Hospitality, Tourism, and Recreation

Information and Communication Technologies
- Information Support and Services
- Networking
- Software and Systems Development
- Games and Simulation

Manufacturing and Product Development
- Graphic Production Technologies
- Machining and Forming Technologies
- Welding and Materials Joining
- Product Innovation and Design

Marketing, Sales, and Services
- Marketing
- Professional Sales
- Entrepreneurship/ Self-Employment

Public Services
- Public Safety
- Emergency Response
- Legal Practices

Transportation
- Operations
- Structural Repair and Refinishing
- Systems Diagnostics, Service, and Repair

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

Learning that works for California
CTE™

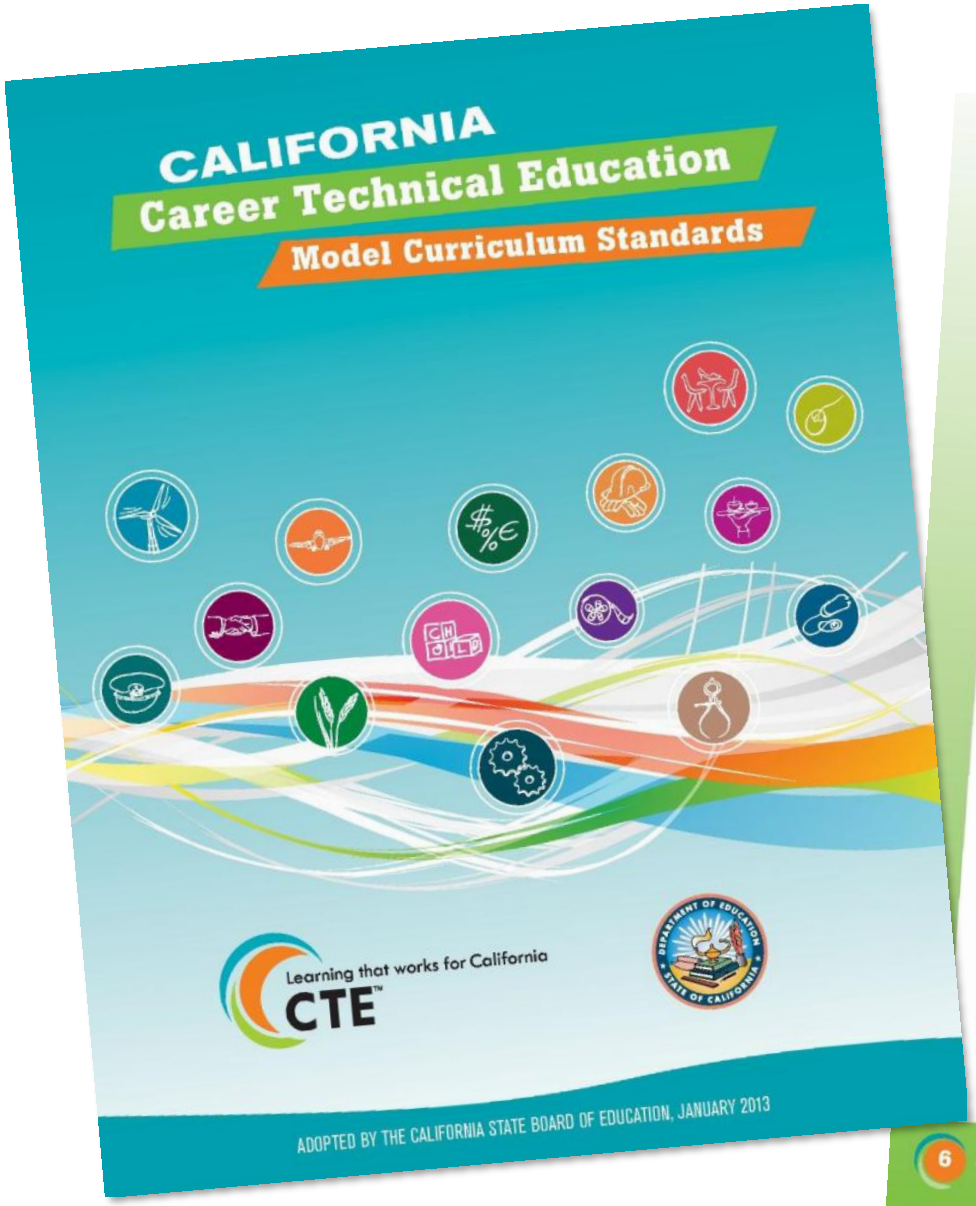


Table 1: CTE Anchor Standards—Common Core English Language Arts Alignment

ANCHOR STANDARD	CCSS ELA Standards Code(s)
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.	Note: alignment listed within each sector
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.	LS 9–10, 11–12.6
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.	SLS 11–12.2
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.	WS 11–12.6
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.	WS 11–12.7
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.	RSTS 9–10 11–12.4
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.	SLS 9–10 11–12.1
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.	SLS 11–12.1d
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.	SLS 11–12.1b
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.	WS 11–12.6
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.	Note: no alignment evident for this standard

https://www.cde.ca.gov/ci/ct/sf/ctemcstandards.asp

"If current trends continue, roughly one-third of new jobs in **California** will require some training beyond high school but less than a four-year degree."

"During the 2016-17 school year, close to 800,000 high school students (**45%) enrolled in a CTE course**."

California Fast Facts

- 6,220,413
  Public School Students
- 1,745,197
  High School Students

PPIC | PUBLIC POLICY INSTITUTE OF CALIFORNIA

Purpose:

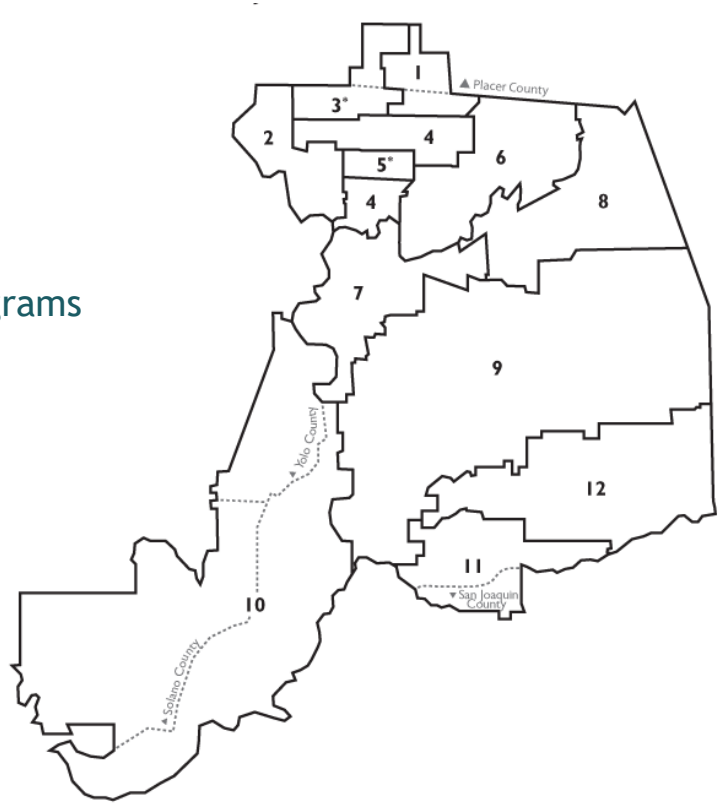
Through a competitive grant process, the purpose of the Career Technical Education (CTE) Facilities Program is to provide matching funds for the purpose of CTE specific new construction, modernization, and/or equipment.

Project Requirements	Maximum Potential Score
Cover Page (Form A)	0
Part 1. Career Technical Education Plan	33
Part 2. Projections of Student Enrollment	15
Part 3. Identification of Feeder Schools and Partners	9
Part 4. The Accountability Plan	15
Part 5. Educational Specifications and Equipment/Space Requirements	24
Part 6. Budget Justification/Detail Sheet (Form B)	36
Part 7. Unique Conditions (If Applicable)	3
Part 8. Overall Feasibility of the project ***This is not a category to be addressed by the applicant, but rather a rated area on the scoring rubric for the reviewer.***	6
Total	141

Case Study: CTE

Elk Grove Unified School District

- 320 Square Miles
- 63,061 Students
- 67 Schools
- # Students in CTE Programs



Can we highlight Sacramento county on the CA map?

Elk Grove Unified School District

Career Academy and Pathway Programs

COSUMNES OAKS HIGH SCHOOL
-Culinary Arts Academy (Proposed)
-Architectural Design & Urban Planning (Proposed)
-Visual and Performing Arts (Proposed)

ELK GROVE HIGH SCHOOL
-Ag-Science Career Pathway
-Auto Technology Career Pathway
-Graphic Arts Career Academy*(Proposed)

FLORIN HIGH SCHOOL
-Ag TECH Career Academy
-Auto Technology Career Pathway
-Business Education Technology (BET) Academy

FRANKLIN HIGH SCHOOL
-School of Technology, Engineering and Media (STEM) Academy

LAGUNA CREEK HIGH SCHOOL
-Manufacturing Production Technology Academy (MPTA)
-Business Careers Academy
-Sports Careers Academy

MONTEREY TRAIL HIGH SCHOOL
-Design and Technology Academy (DATA)

PLEASANT GROVE HIGH SCHOOL
-CADD/Comm Academy
-Public Service Academy

SHELDON HIGH SCHOOL
-ARTSwork Career Pathway
-Biotechnology Academy
-Engineering Career Pathway
-Equitas Career Pathway

VALLEY HIGH SCHOOL
-Health TECH Academy
-Careers in Education Management and Training (CEMT) Academy

Cosumnes Oaks Culinary Academy

STAFFORD, KING WIESE ARCHITECTS

Culinary Arts Academy

Image by: Freepik

Culinary
Arts
Academy

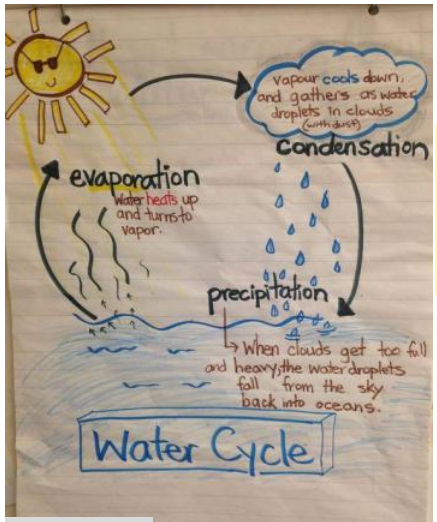
“All I really need to know I learned in Kindergarten.”

- Robert Fulghum

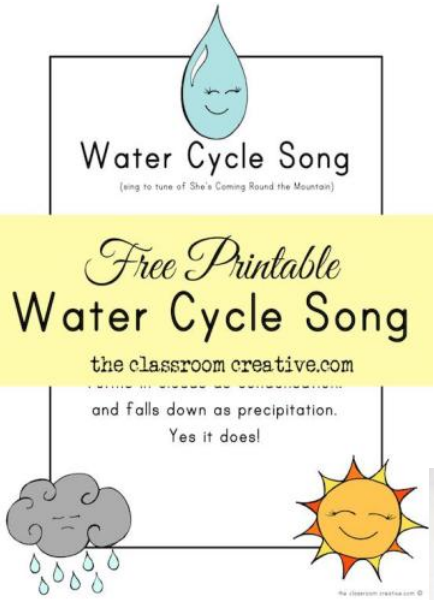
1. More Space
2. Flexibility Sit, Stand, Soft
3. Alone, Together, Small
4. “Stuff”
5. Outdoor Learning

5 Integrated…

Technology

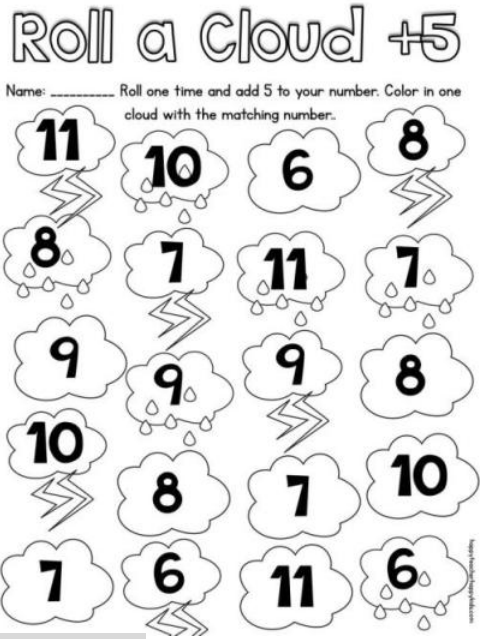


Direct

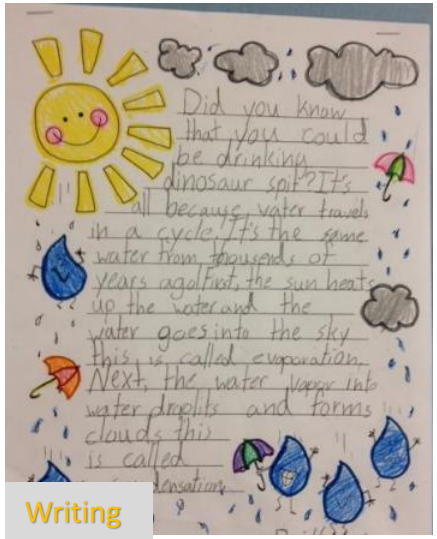


Music

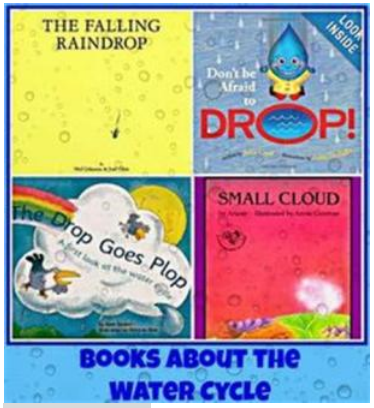
Science



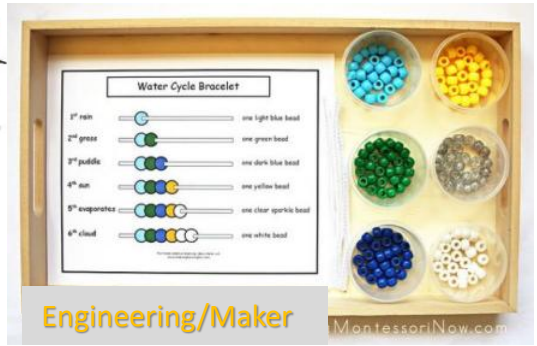
Math



Writing



Reading

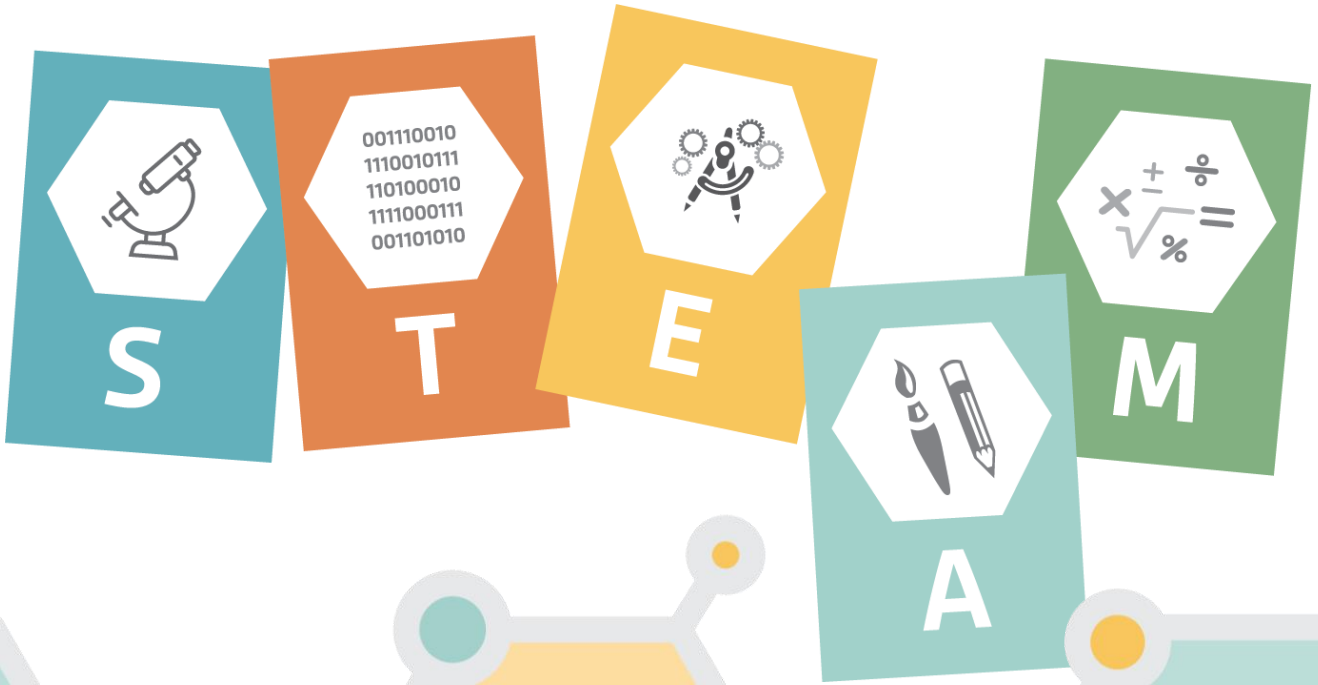


Engineering/Maker

Art

“I have no hesitation in saying we need to add the letter A…and education devoid of the arts …is an empty, half-brain kind of education.”

- Howard Gardner, Harvard Graduate School of Education



Case Study: STEAM

Sylvan Middle School San Juan Unified School District

EXISTING

Renovate 18 Existing Classrooms

Reclaim 2 K-Spaces
- Administration Expansion
- Media Lab

Relocate 2 portables
- Staff Lounge
- Classroom

Reuse 2 portables
- Textbook Storage
- Classroom

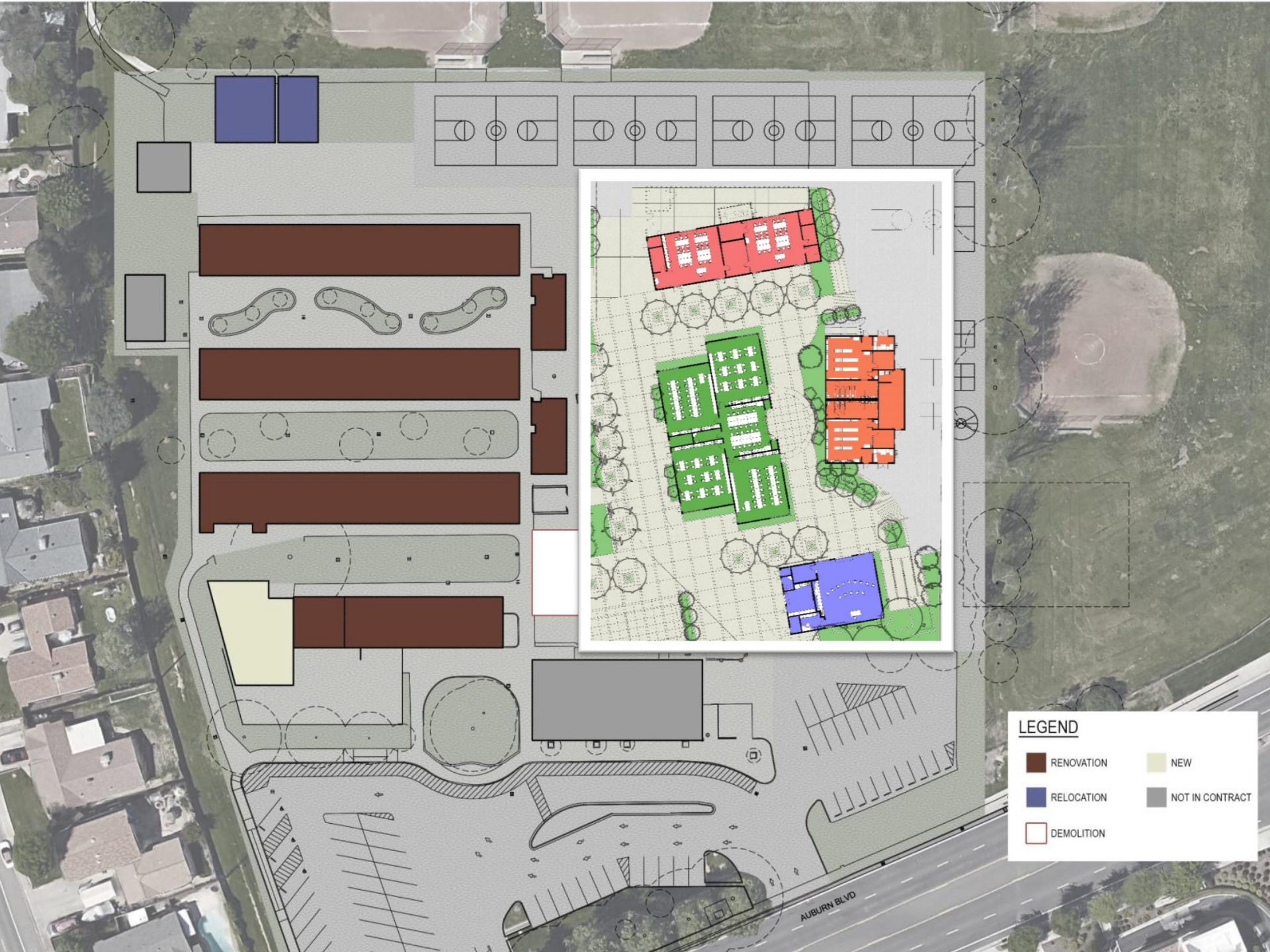
Demolish one building

Multi-Purpose/Food Service “as is”

NEW

Construct New Labs
- Science (4)
- Maker Lab
- Art Lab

Site Plan

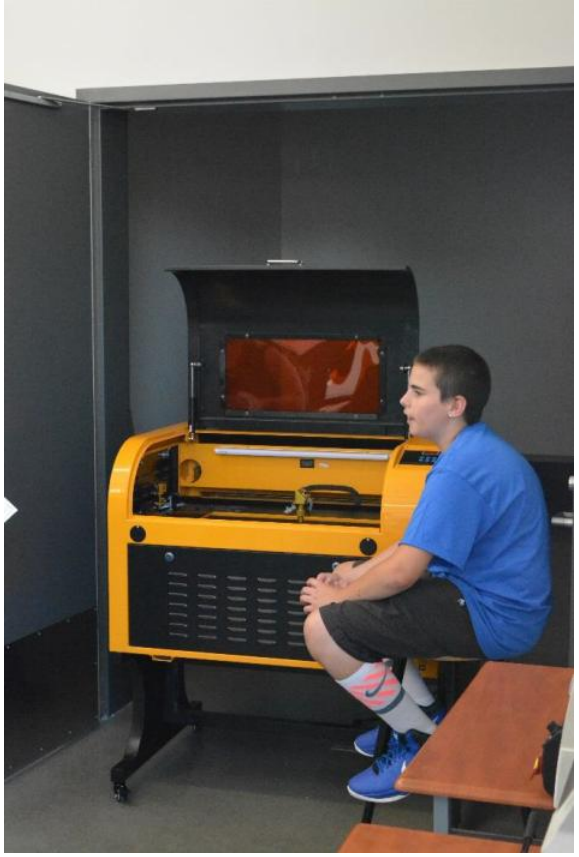

LEGEND
RENOVATION
NEW
RELOCATION
NOT IN CONTRACT
DEMOLITION
AUBURN BLVD

Community STEAM Night

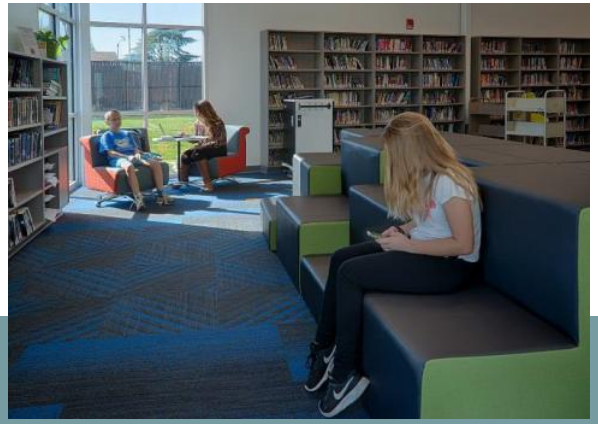
Powered by STEAM

What are the facilities lessons of the CO2 Racers?


If you are interested in Boys' basketball and didn't get a flyer, extra forms are available in the office.
[END]




EXIT



Flexibility

Furnishings Matter

Transformed

Transformed

Learning Commons

Powered by STEAM

So, how do we get there?

6,220,414 Students
1,026 School Districts
10,473 Schools
313,989 Teachers

Somewhere around **200,000** Classrooms?

Incremental Change...

A — Cells and Bells

B — Integrate Technology and Add Flexible Furnishings

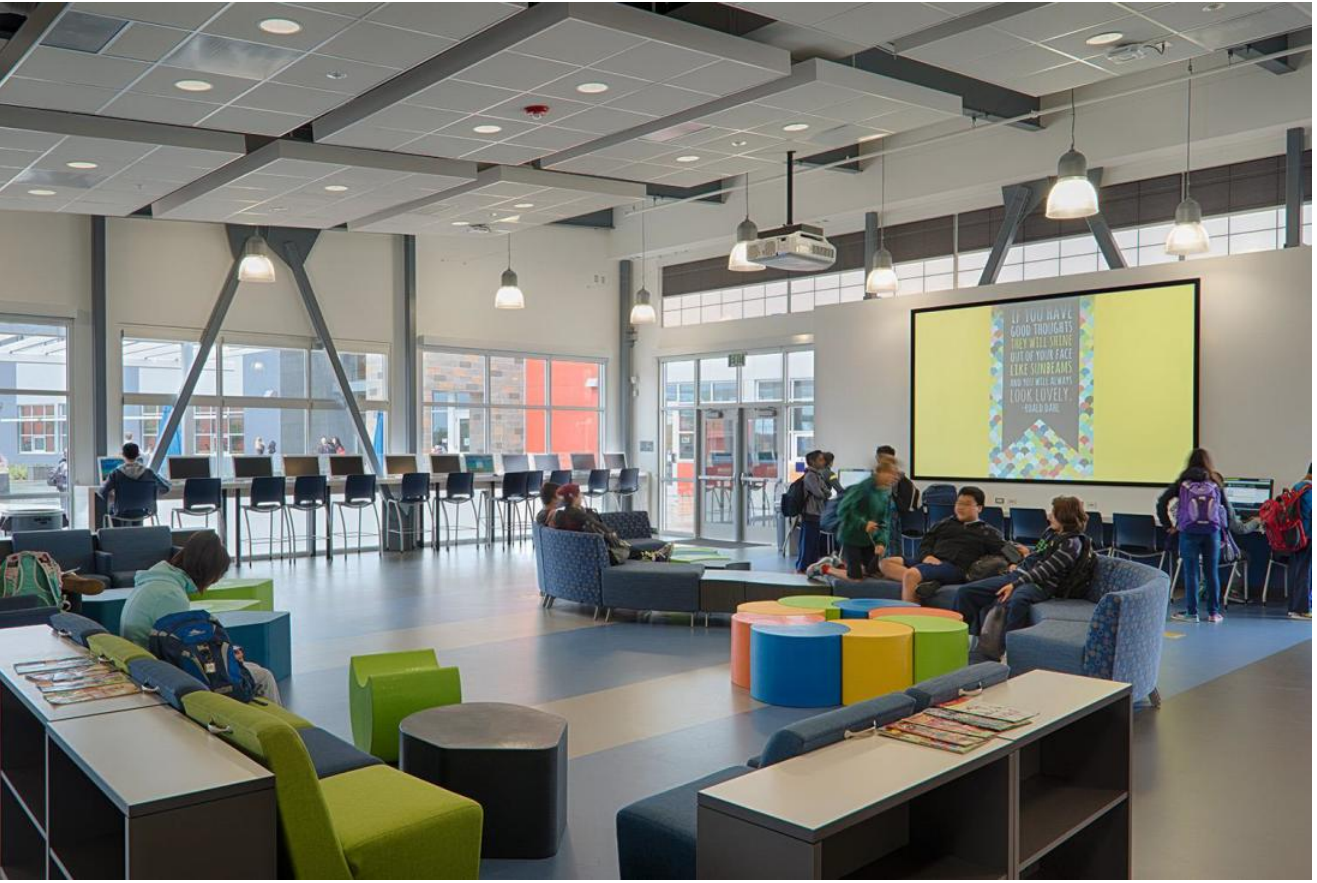
C — Create A Few Demonstration Spaces

Balance Ball

Desks on Risers

Cushions on tires

…Or Rely on Teacher Hacking?



…Or the Big Bang?

TELL ME AND I
FORGET.

TEACH ME AND I
REMEMBER.

INVOLVE ME AND I
LEARN.

- BENJAMIN FRANKLIN

Real world, hands-on and integrated
10:30 to Noon
Friday, November 2
Salon 12

0 -10 minutes	Slides 1 – 4 (Laura)
10 – 20 minutes	Slides 5 – 9 (Kathleen)
20 – 45 minutes	Slides 10 – 15, including Skype (Bill)
45 – 65 minutes	Slides 16 – 33 (Laura/Kathleen) – see notes page
65 – 75 minutes	Slides 34 –38 (Kathleen/Laura) – see notes page
75 – 90 minutes	Q & A