



EDUCATING EVERY CALIFORNIA STUDENT IN,
ABOUT, AND FOR THE ENVIRONMENT:

A Call to Action for County, District, and Educational Leaders



CALIFORNIA
ENVIRONMENTAL
LITERACY
INITIATIVE



Integrating subjects such as science, history-social science, health, social justice, and environmental justice provides a unique opportunity to equip our students with a relevant and meaningful appreciation for stewardship of the environment, while providing valuable real-world experiences.”

TONY THURMOND,
STATE SUPERINTENDENT OF PUBLIC INSTRUCTION

Why Environmental Literacy? Why Now?



I don't know how to balance out my emotions around the climate crisis and this chaotic unknown future, with the everyday stress of homework and daily life. I really wish we were better prepared at school for understanding climate change and developing solutions for a more sustainable future. It is so hard to really know what is going on when none of our teachers are talking about it."

10TH GRADE STUDENT,
MILLS HIGH SCHOOL, CALIFORNIA

Youth around the world and here at home are voicing their sense of urgency to protect the natural systems upon which all of our lives depend. It is our responsibility to empower our students with the knowledge, support, and skills they need now to face their future. As educators, we must work alongside students to ensure access to clean air and water, healthy food, and safe schools in every community. Our schools must be models of sustainable and inclusive practices, and our educational programs must be action- and solution-oriented.

About Environmental Literacy

Environmental literacy is a critical outcome of K–12 education for California's students, ensuring that students acquire the knowledge and motivation to think critically and act in ways that reflect an understanding of the interrelatedness of human and natural systems. According to California's Blueprint for Environmental Literacy (2015),¹ "an environmentally literate person has the capacity to act individually and with others to support ecologically sound, economically prosperous, and equitable communities for present and future generations. Through lived experiences and education programs that include classroom-based lessons, experiential education, and outdoor learning, students will become environmentally literate, developing the knowledge, skills, and understanding of environmental principles to analyze environmental issues and make informed decisions." As educators and administrators, we are responsible for making sure all students understand and can communicate about California's Environmental Principles and Concepts (EP&Cs)² as outlined in our Frameworks for Science (2016), History–Social Science (2016), and Health (2019), and as codified in Education Code as a result of Senate Bill 720 (Allen, 2018).³ This confluence provides a compelling and authentic opportunity for integration across the disciplines and pushes us to address our students' most pressing needs.

The Role of County Offices of Education and Districts

For environmental literacy to be implemented equitably, it must be implemented at a local level. School districts are well-positioned as the unit of change to bring environmental literacy to California's K–12 students. With innovative leadership from county offices of education and other regional support organizations, districts can offer all students **equitable access** to relevant learning experiences that are universal in design, integrate social and emotional learning competencies, and highlight real-world interdisciplinary connections.

The Benefit to Districts

Teaching and learning using the environment as an integrating context aligns well with the California **Multi-Tiered System of Support (CA MTSS)** framework, can help local education agencies meet their **LCAP priorities**, can

improve district **School Dashboard** outcomes, and helps districts comply with new state regulations for instruction and campus sustainability.⁴ Environmental literacy initiatives can address root causes of performance issues or disparities among groups for districts receiving **Differentiated Assistance**. This document describes some of the many ways this can be accomplished.

The environment is present everywhere on a school's campus and operations—energy, water, waste, food, purchasing, buildings and grounds, and the broader community and ecosystems in which all of our urban, suburban, and rural schools operate. This provides rich opportunities for students to investigate, adding relevance to learning in core content areas. In this way, environmental literacy is about students deeply understanding the interactions and interdependence of natural systems and human social systems, and taking local actions as a result.

¹ <https://www.cde.ca.gov/pd/ca/sc/envronliteracyblueprint.asp>

² <https://www.californiaeei.org/epc>

³ https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB720

⁴ <https://sites.google.com/smcoe.org/smcoe-environmental-literacy/resources/green-campus>



How do we think about the world in our own backyard when we think of nature as being ‘out there’? How do we make sure they’re really learning that they need to take care of the classroom, the community, where they live, and to be aware of what’s going on globally?”

KELLEY BARRETT, SCIENCE COORDINATOR,
ANAHEIM ELEMENTARY SCHOOL DISTRICT

Environmental Literacy—California’s Promise

This matrix shows how guiding structures in California’s educational landscape—LCAPs, CA MTSS, and Environmental Literacy (as codified in SB 720)—mutually support conditions of learning, engagement, and pupil outcomes⁶.

STATE PRIORITIES			
Planning Guidance	CONDITIONS OF LEARNING	ENGAGEMENT	PUPIL OUTCOMES
LCAP <hr/> Local Control Accountability Plan⁵	<p>Students are provided with safe and properly maintained schools. Teachers are fully credentialed to teach their subject area and students are provided with a broad course of study that helps them develop critical thinking skills and prepares them to be civically engaged and college and career ready.</p>	<p>Students are provided with motivating programs, coursework, and opportunities where they feel respected, included socially and emotionally, and cared for both in and out of the classroom. Families, schools, and communities work closely together to build a strong framework for student achievement.</p>	<p>Student achievement means improving outcomes for all students to ensure student success.</p>
CA MTSS <hr/> California Multi-Tiered System of Support⁶	<p>All students regardless of age, race, zip code, language, physical challenge, intellectual ability, capacity, or competency are provided with the most inclusive learning environment. A Universal Design for Learning approach meets the needs of diverse learners through multiple means of representation and expression.</p>	<p>Families and community members are partners where they have options for meaningful involvement in students’ education and in the life of the school, and the school responds to family interests and involvement in a culturally-responsive manner.</p>	<p>All students are provided with a continuum of services that address their academic, behavioral, social-emotional learning, health, and well-being needs.</p>
Environmental Literacy <hr/> SB 720 (2018) “Environmental education: environmental principles and concepts”⁷ 	<p>Educators should “ensure that environmental literacy curriculum and learning experiences are made available on an equitable basis to all pupils and that [they] reflect the linguistic, ethnic, and socioeconomic diversity of California... [to] provide a critical foundation of skills and knowledge to help pupils compete in a growing job market where science, mathematics, engineering, technology, and language arts proficiency are highly sought after.”</p>	<p>Educators have access to partnerships that provide the necessary training and resources to support the delivery of environmental literacy curriculum to California students. SB 720 directs state leaders to “assist in building and supporting partnerships and regional and statewide networks of public and private agencies and organizations, including county offices of education, school districts, and private partners, such as not-for-profit organizations, and community-based education providers that support the advancement of environmental literacy in California.”</p>	<p>For all students, standards-based “environmental literacy constitutes an important curriculum content area, and also provides problem solving skills and hands-on, real-world learning experiences that have been demonstrated through educational research to enhance pupils’ achievement across many subject areas, promoting understanding and engagement in learning.”</p>

⁵ https://www.lawrencehallofscience.org/programs_for_schools/lcap_toolkit

⁶ <https://ocde.us/MTSS/Pages/LCAP-and-MTSS-Alignment-Documents.aspx>

⁷ https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB720



The following tables show compelling evidence for how the integration of environmental literacy supports districts and counties in promoting LCAP priorities and the CA MTSS framework.

CONDITIONS OF LEARNING



Integrating environmental literacy approaches into **core curriculum** and instruction helps all students master academic content and become environmentally literate. Considering California's Environmental Principles and Concepts when selecting curriculum and providing rigorous instruction that is locally-based and culturally-relevant is critical for educators to make the key shifts outlined in California state standards and frameworks. Educators who focus on environmental literacy prepare students for college and career pathways and for making informed decisions about the resource and sustainability issues that face their communities and our future. Schools that embrace a green facilities approach fulfill their responsibility to provide employees and learners with access to clean indoor air, safe water, and healthy surroundings, and to supporting the well-being of all community members.

LCAP PRIORITY 1 Basic Services

Instructional Materials: The state has adopted Environmental Principles and Concepts (EP&Cs) that are the foundation for understanding human and natural system interactions and interdependence across the curriculum. Integration of the EP&Cs is a criteria for adopted instructional materials in science, history-social science, and health. In science, the **CA NGSS TIME (Toolkit for Instructional Materials Evaluation)**⁸ provides guidance for adopting instructional materials aligned to the Next Generation Science Standards (NGSS) and EP&Cs.

Facilities & Green Schoolyards: There are numerous mandates and requirements for facilities and operations to shift to green practices⁹ that support student, staff, and environmental health. This greening offers opportunities to leverage the **campus as a laboratory for learning**. Spending time learning outdoors has numerous benefits to youth and adult **health and well-being**, including a reduction in anxiety and depression.¹⁰ Creating more efficient facilities and operations also helps schools become eligible for state and federal recognition and awards such as the **Green Ribbon Schools** program.¹¹

LCAP PRIORITY 2 Standards Implementation

Environmental education helps teachers enact the **instructional shifts** described within the subject frameworks.¹² It is the responsibility of classroom teachers to provide **equitable access** to environmental literacy experiences by embedding these experiences into their existing curriculum and instruction, and is the responsibility of principals and district administrators who provide guidance, support, resources and professional learning opportunities for teachers. This integration is supported by law (AB 1548 (Pavley), SB 720 (Allen)), requiring that EP&Cs be addressed in adopted instructional materials for science, history-social science, and health, and suggested for all other subjects as practicable.

Science Framework: Highlighted instructional strategies include having students explore real-world phenomena through **outdoor** and environmental learning experiences, participate in problem-based learning, and **application of engineering design strategies to solve real-world problems**. (Chapter 11)¹³

History-Social Science Framework: Students "analyze how relationships between humans and environments (including **human-induced environmental change and changes** in technology) affect settlement and movement, diffusion of ideas and cultural practices, and conflict and cooperation... and economic growth." (p.129)¹⁴

Health Framework: "Concerns about achieving **environmental justice** are a critical social dimension of health education because of the potential broad-ranging community effects of environmental issues such as air pollution, water pollution, and toxic chemicals released by industrial and other activities." (April 2019 Draft, p. 6)¹⁵

LCAP PRIORITY 7 Course Access

Research shows that weaving together science and language development can increase students' academic performance in reading, writing, and science simultaneously. Through environmental literacy taught in an integrated context, all students have improved access to a broad course of study, including **socioeconomically disadvantaged students, English learners, students with disabilities, and foster youth**.¹⁶

Access to **outdoor education** experiences on and off campus as part of the core curriculum should be equitably distributed among all students within a district. Teaching outdoors **improves student focus** back in the classroom.¹⁷

Increasing and improving services to students by collaborating with **community partners** provides students with access to learning opportunities that support rigorous content standards and access to course content.

MTSS—UNIVERSAL DESIGN FOR LEARNING (UDL)

Educating for environmental literacy includes key UDL elements of **engagement, representation, action, and expression**. Using environmental instructional strategies as a Tier 1 approach allows students **multiple means of access to standards-based concepts**. Stanford University researchers conducted a systematic analysis of peer-reviewed research which supports this approach.¹⁸ Qualitative evidence provided by teachers in the study often echoed this teacher's statement: "I have students with a variety of learning styles and learning abilities. The hands-on aspect was an equalizer. There's more collaboration and engagement and it contextualizes what they're learning. The kids who have trouble learning, and for the kids who are super advanced, they're all having the same discussions." Data from another large scale review of empirical research concluded that "Outdoor experiences help kids stay more engaged in the classroom by making school work more relevant and fun, through hands-on activities that show children how their lessons in school apply to the world around them."¹⁹

8 https://drive.google.com/drive/folders/1-HaYVZ0t2orZ0198SOAi_tpOHvOn0reP?usp=drive_open
 9 <https://docs.google.com/document/d/1STnR6Ur9AealPo7RJRpdpdQWeQFKuf3WE1nNyOloqs/edit>
 10 <http://izea.net/spotlight-articles/connecting-with-nature-to-care-for-ourselves-and-the-earth-report>
 11 <https://www.cde.ca.gov/ls/fa/sf/greenribbonprog.asp>
 12 https://catalyst.greenschoolsnationalnetwork.org/gscatalyst/june_2019/MobilePagedReplica.action?pm=1&folio=35#pg35
 13 <https://www.cde.ca.gov/ci/sc/cf/documents/scifwchapter11.pdf>
 14 <https://www.cde.ca.gov/ci/hs/cf/documents/hssframeworkwhole.pdf>

15 <https://www.cde.ca.gov/ci/he/cf/>
 16 <https://west.edtrust.org/resource/unlocking-learning-science-lever-english-learner-equity/>
 17 https://greatergood.berkeley.edu/article/item/the_surprising_benefits_of_teaching_a_class_outside
 18 https://cdn.naee.org/sites/default/files/eeeworks/files/academic_benefits_final.pdf
 19 http://grayff.org/wp-content/uploads/2013/10/Empirical-Evidence-Supporting-Benefits-of-Outdoor-School-and-Experiential-Learning-Programs_March-2015.pdf



Environmental literacy is a solution to the problem of disintegration across multiple content areas that makes learning easier, makes teaching easier, and makes instructional minutes more efficient.”

DR. SCOTT WALKER, PROGRAM SPECIALIST,
EDUCATION SERVICES, MONTEBELLO UNIFIED SCHOOL DISTRICT

ENGAGEMENT



Students are more eager to attend school when they are learning about relevant topics that connect them to each other, their community, and the natural world. The integration of environmental literacy can accomplish this. The approach transforms students and schools because the environment has a connection to curriculum and instruction, facilities and operations, outdoor and community-based programs, and the overall culture and climate of our schools. Learning through the lens of the environment engages stakeholders and improves outcomes for key indicators such as attendance and graduation rates.

LCAP PRIORITY 3

Parent Involvement

Our families care deeply about the environment and are vital partners in building **community** wellness and **resilience**. Parents are concerned about the health effects of pollution that disproportionately affect Black and Hispanic populations.²⁰

Research shows that 89% of Californians think it's important that K–12 schools include environmental education²¹ and 80% of parents want schools to teach explicitly about **climate change**.²²

Trauma-informed practices such as providing students and families with the opportunity to engage in solutionary action and advocacy provides an opportunity to mitigate or reduce the negative emotional and physical impacts of environmental degradation or climate change.

LCAP PRIORITY 5

Student Engagement

Attendance: Green schools matter. Research has shown that higher **surrounding greenness** is associated with **lower absenteeism**, whereas higher ambient particulate matter from **air pollution** is associated with higher absenteeism, even when race and income are accounted for.²³

Graduation Rate: A recent large-scale study concluded that “the most important thing environmental education provides for students is **passion and interest in learning**.”²⁴ Increasing motivation and engagement are primary factors in graduation rates, and are often changeable at the school site level through curriculum, pedagogy, school programs, and relationship-building.²⁵

LCAP PRIORITY 6

School Climate

School Climate: 94% of **teachers** report better working relationships with their colleagues and students when using the environment as an integrating context for learning. For students, 93% act with **greater civility** towards their peers, 94% have greater communication skills, and 98% have a better ability to work in group settings.²⁶

Behavior, Suspension, and Expulsion: Research demonstrates positive associations between **garden-based learning** and engagement of students, especially for students considered to be disengaged in the school system.²⁷ Green schoolyards lead to **less bullying** among youth living in urban, low-income neighborhoods by providing natural and safe spaces for prosocial behavior.²⁸

CA MTSS— CULTURALLY RESPONSIVE TEACHING

Culturally responsive teaching means using the cultural knowledge, prior experiences, frames of reference, and performance styles of ethnically diverse students to make learning encounters more relevant and effective for them... It helps develop a sense of personal efficacy, building positive relationships and shared responsibility.²⁹ When students investigate **local phenomena** affecting their own communities, they are especially likely to bring valuable cultural and linguistic **funds of knowledge** from family and community ways of knowing to bear on their school work. “Interdisciplinary instruction that involves students in investigations of local, community, and global environmental issues provides them with opportunities to build and bring together their knowledge of science and understanding of history, economics, and social sciences—as well as communication skills, analytical and mathematical thinking, and an awareness of how people and government agencies make decisions that affect them.”³⁰ When students are empowered through structured opportunities to develop college and career skills with community partners and to advocate for **environmental and intergenerational justice**, schools can become models and community hubs for truly restorative practices.

20 <https://www.npr.org/sections/health-shots/2019/03/11/702348935/study-finds-racial-gap-between-who-causes-air-pollution-and-who-breathes-it>

21 <https://www.cde.ca.gov/pd/ca/sc/documents/envronliteracyblueprint.pdf>

22 <https://www.npr.org/2019/04/22/714262267/most-teachers-dont-teach-climate-change-4-in-5-parents-wish-they-did>

23 <https://www.mdpi.com/1660-4601/14/2/207>

24 <https://naaee.org/eepro/research/eeworks/student-outcomes>

25 <https://www.nap.edu/read/10421/chapter/2#3>

26 <http://www.seer.org/extras/execsum.pdf>

27 <https://naaee.org/eepro/research/library/sowing-and-growing-life-skills-through>

28 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5980974/>

29 <http://home.lausd.net/ourpages/auto/2012/5/16/56204676/LAUSD%20EL%20Master%20Plan%202012%20English.PDF>

30 <https://tenstrands.org/bel/a-confluence-of-opportunities-for-expanding-environmental-literacy>

31 <https://www.cde.ca.gov/ta/tg/ca/documents/castblueprint.pdf>

32 <https://www.cde.ca.gov/ta/tg/ca/castitemspecs.asp>

33 https://casience.org/application/files/8215/5984/3944/Position_Statement_on_Environmental_Literacy_for_All_California_Students.pdf

[Literacy for All California Students.pdf](https://casience.org/application/files/8215/5984/3944/Position_Statement_on_Environmental_Literacy_for_All_California_Students.pdf)

34 <http://www.ncicoalition.org/why-is-ee-important.php>

35 https://cdn.naaee.org/sites/default/files/eeworks/files/k-12_student_key_findings.pdf

36 <https://www.cde.ca.gov/pd/ca/sc/envronliteracyblueprint.asp>

37 <https://www.cde.ca.gov/ci/ct/sf/ctcmstandards.asp>

38 https://www.stancoe.org/sites/default/files/instructional-support-services/HSS/Civic%20Learning%20Compendium_CCSS_FINAL.pdf

39 <https://www.cde.ca.gov/pd/ca/hs/hssstateseal.asp>

40 <https://naaee.org/eepro/research/eeworks/student-outcomes>

41 https://casience.org/application/files/8215/5984/3944/Position_Statement_on_Environmental_Literacy_for_All_California_Students.pdf

42 <https://www.cde.ca.gov/ea/in/socialeotionallearning.asp>

43 <https://casel.org/core-competencies>

44 <https://naaee.org/eepro/research/eeworks/student-outcomes>

PUPIL PERFORMANCE OUTCOMES



Developing environmental literacy helps students achieve academic goals for college and career readiness and become leaders in their community at any age. Environmental investigations are interdisciplinary by nature, and help students build skills in ELA, mathematics, problem solving, and critical thinking. Environmental literacy helps students go from apathy to agency, and time in the outdoors is good for mental and physical health, supporting whole child development with improved academic performance. Experiencing and witnessing the impact of climate change and environmental degradation affects physical and mental health for most vulnerable populations (including children), which can limit academic performance. Students around the world are advocating for a better future for themselves and those that will come after them. This is a call to action for educators to prepare them for this challenge.

PRIORITY 4

Student Achievement

California Science Test (CAST): The EP&Cs are used as context for questions on the CAST of the NGSS.³¹ The "CAST Item Specifications" provide detailed and thought-provoking examples of NGSS and EP&C integration and can be explored in teacher and administrator professional learning sessions.³²

STEM Equity: According to the California Science Teachers Association (CSTA), "Transitioning to the use of environmental issues as a context for learning **increases interest in STEM by traditionally underrepresented students**, supporting the idea that environmental learning is an equity strategy."³³

English Language Arts & Math Smarter Balanced Assessments: When integrated into the core curricula or used as an integrating theme across the curriculum, environmental education has a measurably positive impact not only on student achievement in **science**, but also in **reading** (sometimes spectacularly), **math**, and **social studies**.^{34, 35}

Interdisciplinary Learning: California's Department of Education considers environmental literacy the "bridge across subject areas" that will allow the

"pedagogical convergence" of mathematics, English language arts, Next Generation Science Standards, history-social science, health, and career technical education to produce the 21st-century skills sought after by employers.³⁶

Career Technical Education (CTE): Environmental literacy is integral to CTE Pathways including Agriculture and Natural Resources; Energy, Environment, and Utilities; and Engineering and Architecture.³⁷

PRIORITY 8

Student Outcomes - Local Measures

California's Civic Learning Compendium³⁸ highlights numerous **service learning projects** through which students might earn the **State Seal of Civic Engagement**³⁹ with their high school diplomas. Research shows that environmental education can "instill a sense of personal **responsibility and motivation** to address community and environmental issues."⁴⁰

According to the CSTA's recent position statement on environmental literacy, "Teaching with an emphasis on **local environmental issues** enables students and their communities to be 'sustainable,' providing students the necessary tools to be conscious consumers, informed members of society, and knowledgeable advocates for natural resources and systems."⁴¹

CA MTSS—SOCIAL-EMOTIONAL LEARNING

Decades of research shows that teaching towards environmental literacy develops California's social-emotional learning (CASEL)⁴² competencies of **self awareness, social awareness, responsible decision-making, self management, and relationship skills**.⁴³ "Environmental education imparts more than knowledge," reports Stanford researcher Dr. Nicole Ardoin. "It provides a continuum of experiences that support academic, behavioral, and social-emotional growth. The research shows that "environmental education has helped produce effective problem solvers, lifelong learners, and thoughtful community leaders and participants. The emotional and social skill-related benefits that a number of studies in the review documented include self-esteem, autonomy, character development, maturity, empowerment, verbal communication, leadership, poise, and the ability to collaborate with others." Students are also introduced to positive civic engagement opportunities as they address community and environmental issues such as waste reduction, energy and water conservation, and sustainability policies.⁴⁴

ACTION STEPS

1

Convene a **leadership team** to design an **environmental literacy** plan with your stakeholders, including educational and operational administrators, teachers, students, families, community-based organizations, and businesses.

2

Advocate for the inclusion of environmental literacy goals, actions, and budget items in **LCAPs**, strategic plans, school site plans, etc.

3

Ensure that teachers engage in **professional learning** so that students are taught **Environmental Principles and Concepts** at every grade level through standards-based learning experiences on campus, in the community, and in outdoor spaces.

4

Reduce your site's **ecological footprint** using the **California Green Ribbon Schools** guidelines, so that students build environmental literacy and self-efficacy while addressing real-world sustainability and climate resiliency challenges.

5

Refer to **additional resources** provided in this document's footnotes, visit the CAELI website, draw from the Lawrence Hall of Science's LCAP Toolkit⁴⁵, and reach out to your County Office of Education.

⁴⁵ https://www.lawrencehallofscience.org/programs_for_schools/lcap_toolkit

