

# ADDRESSING ENVIRONMENTAL LITERACY IN THE AGE OF NGSS



# TODAY'S PRESENTERS

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- Host: Mary Briggs, Education Policy Analyst, CSBA

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# Addressing Environmental Literacy in the Age of NGSS

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## Who We Are



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Evaluation Director at WestEd



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at WestEd

# Environmental Instruction Catalyzes Standards-Based Science Teaching

How Environmental Literacy Aids Implementation of the NGSS

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Ashley Iveland  
Ted Britton  
Burr Tyler  
Elizabeth Arnett

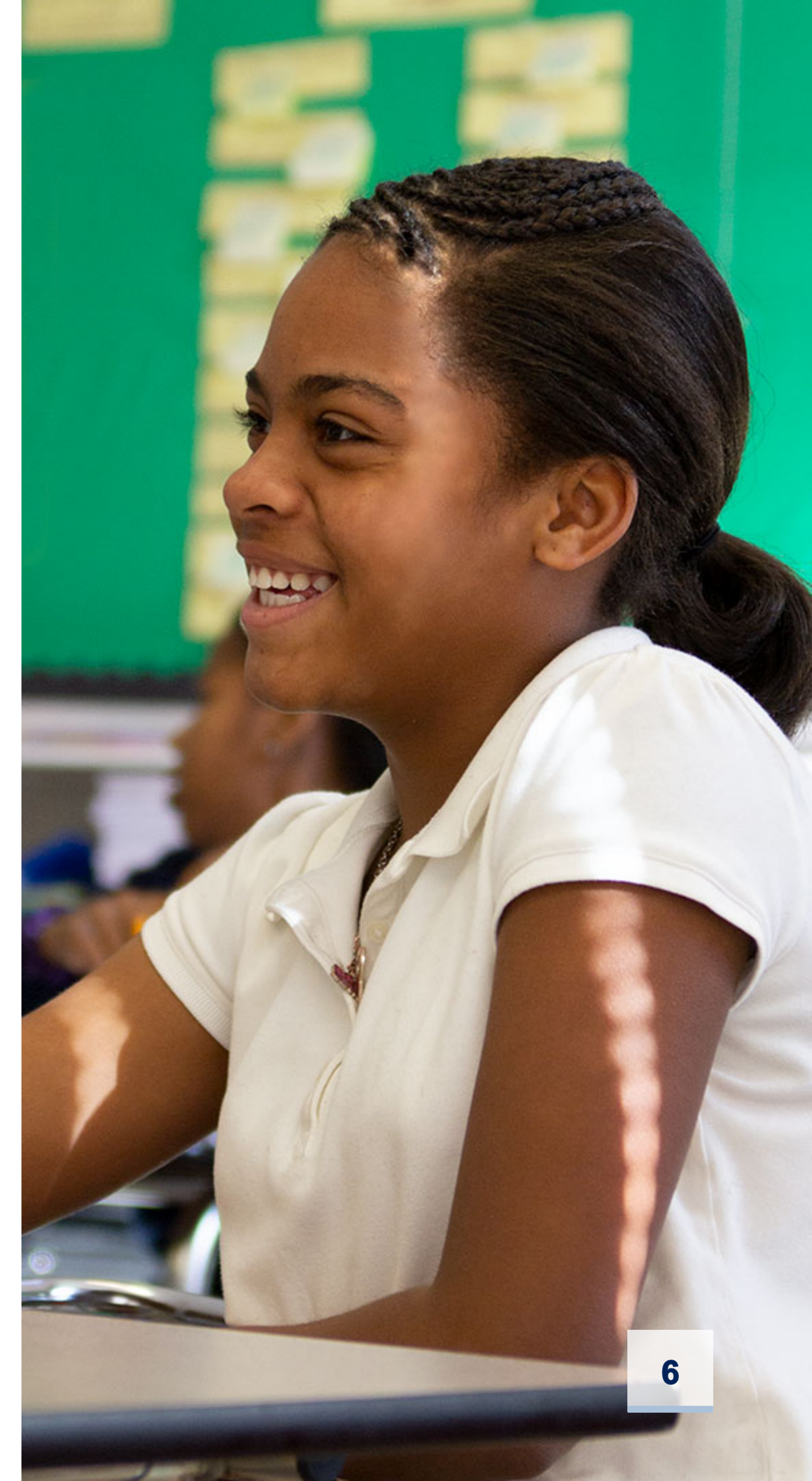


## Early Implementers Evaluation Report on Environmental Literacy and the NGSS

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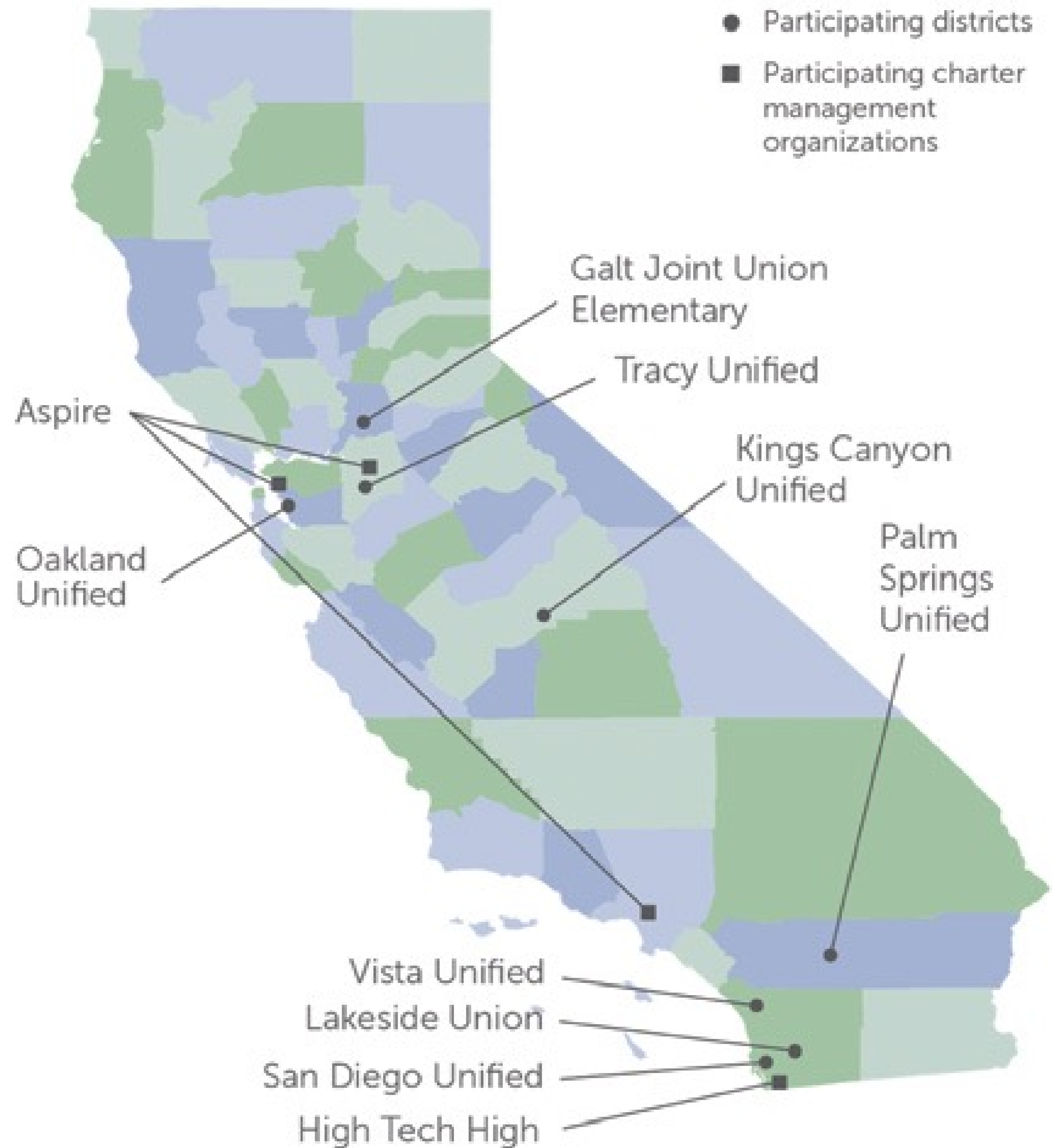
# Agenda

- ❖ Importance of environmental literacy (EL)
- ❖ How EL supports the NGSS
- ❖ How you can support EL
- ❖ Challenges
- ❖ Resources



# California K-8 NGSS Early Implementers Initiative (2014 - 2020)

- ❖ 8 districts
- ❖ 2 charters





# Why Environmental Literacy is Important







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## Think About Your Own Relationship With the Environment

- **Why do you care about environmental issues?**

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# The Environment Is Engaging and Relatable

Teachers had personal stories to explain:

- why they care about environmental literacy
- how they empower students to make a difference in their world
- how seeing students care about the environment motivated them



When kids go on field trips, they come back and look at things differently. It really changes them. I realized the world was alive. If that happened to me, that would happen to another human being.

– Teacher



# 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 classroom-based lessons, experiential education, and outdoor learning
- To develop the knowledge, skills, and understanding of environmental principles to analyze environmental issues and make informed decisions

# How Environmental Literacy Supports NGSS Instruction

# Examples of NGSS Science and Engineering Practices (SEPs)

- **Asking Questions and Defining Problems**
- **Planning and Carrying Out Investigations**
- **Constructing Explanations and Designing Solutions**
- **Obtaining, Evaluating, and Communicating Information**



## Field Trips to Explore the Local Natural Environment


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- How does this habitat look different?
- Think about climate change — why does [the city] plant trees on a warming planet?
- Why do we take care of trees?
- Why is it important to take care of places like this?
- How do you feel about all this?

# Environmental Literacy Instruction

- ❖ Environmental phenomenon such as pollution
- ❖ Environmental changes such as wildfires
- ❖ A class created a recycling program for the entire school.





**I'm never going to teach something about the environment that kids cannot do something to make a difference. In the garden, you can have them compost, or even recycle. There's things you can do — there is overlap with civics — you can change the world, make a positive change.**

**– Teacher**



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# History of California's Focus on Environmental Literacy

- **2003 Legislation:** CA Education and the Environment Initiative
- **Today, the most common schema for the field of environmental literacy in California is the Environmental Principles and Concepts, commonly referred to as “EP&Cs.”**
- **Governor Brown signed Senate Bill No. 720 in 2018, which put the EP&Cs into the California Education Code.**



# Environmental Principles and Concepts (the EP&Cs)



1. People depend on natural systems



2. People influence natural systems



3. Natural systems change in ways that people benefit from and can influence



4. There are no permanent or impermeable boundaries that prevent matter from flowing between systems



5. Decisions affecting resources and natural systems are complex and involve many factors

# EP&C Connections in the CA Science Framework

Taken from Appendix 2

Performance Expectations	Connections between EP&Cs, CCCs, and SEPs	Clarifications and Connections between DCIs and EP&Cs	Relevant EEI Units That Can Support NGSS Instruction
<p><b>K-LS1-1.</b> Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water.]</p>	<p><b>Principle I:</b> The continuation and health of individual human lives and of human communities and societies depends on the health of the natural systems that provide essential goods and ecosystem services.</p> <p><b>Principle II:</b> The long-term functioning and health of terrestrial, freshwater, coastal and marine ecosystems are influenced by their relationships with human societies.</p>	<p><b>Disciplinary Core Ideas</b></p> <p>As students learn that:</p> <p><b>LS1.C: Organization for Matter and Energy Flow in Organisms</b>                      "All animals need food in order to live and grow; they obtain their food from plants or from other animals; and plants need water and light to live and grow." (K-LS1-1)</p>	<p>The World around Me</p> <p>A Day In My Life</p>
	<p><b>Crosscutting Concepts</b></p> <p><b>Patterns</b></p> <p>Patterns in the natural and human-designed world can be observed and used as evidence. (K-LS1-1)</p>		
	<p><b>Science and Engineering Practices</b></p> <p><b>Analyzing and Interpreting Data</b></p> <p>Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)</p>		
	<p><b>Connections to Nature of Science</b></p> <p><b>Scientific Knowledge Is Based on Empirical Evidence</b></p> <p>Scientists look for patterns and order when making observations about the world. (K-LS1-1)</p>		
		<p><b>Environmental Principle and Concept(s)</b></p> <p>Students should be developing an understanding:</p> <p><b>Principle I Concept a:</b> "that the goods produced by natural systems are essential to human life and to the functioning of our economies and cultures."</p> <p>and,</p> <p><b>Principle II Concept a:</b> "that direct and indirect changes to natural systems due to the growth of human populations and their consumption rates influence the geographic extent, composition, biological diversity, and viability of natural systems."</p>	

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# Supporting Environmental Literacy Instruction

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# What Can I Do as a Community Leader?

1. Partner with local organizations that support environmental literacy.
2. Encourage environmental literacy in schools and districts.

## Partnerships with Local Organizations to Support Environmental Literacy

1. One district partnered with a variety of organizations (Cal Recycle, Bureau of Land Management, and the local preserve) for outdoor environmental literacy instruction.
2. Another district worked with a local park and teachers at multiple grade levels have convened to plan cohesive, NGSS-aligned lessons centered around this environment.
3. A third district is working on developing partnerships with local businesses to foster students' learning about their food.

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## Encourage Environmental Literacy in Schools and Districts


❖ **Teachers can engage in environmental literacy instruction in students' neighborhoods.**

- ❖ For example, after a summer institute focused on environmental literacy in one district, teachers made connections with the NGSS and a local park to which they often take students for field trips.



The [local park] can provide context for earth, life, and physical science (plus some writing!). The [local park] is a place full of phenomena with questions to explore.

– Teacher



***Even with a patch of weeds, we can talk about what's growing here, what wants to grow here, what seeds are brought in by the wind. . . . It's a huge wake-up to them to realize there is nature right outside. "Look we found this slug! Look we found this salamander!" So the idea is that, "Wait a minute, we're out here in the city, but look at all this stuff that's all over the place."***

– Teacher



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# Challenges That LEAs May Face When Addressing Environmental Literacy

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# Challenges That Schools May Face

1. Integrating environmental literacy with lessons in physical science.
2. Sometimes needing to align the timing of science topics in the curriculum with when events are occurring in nature.

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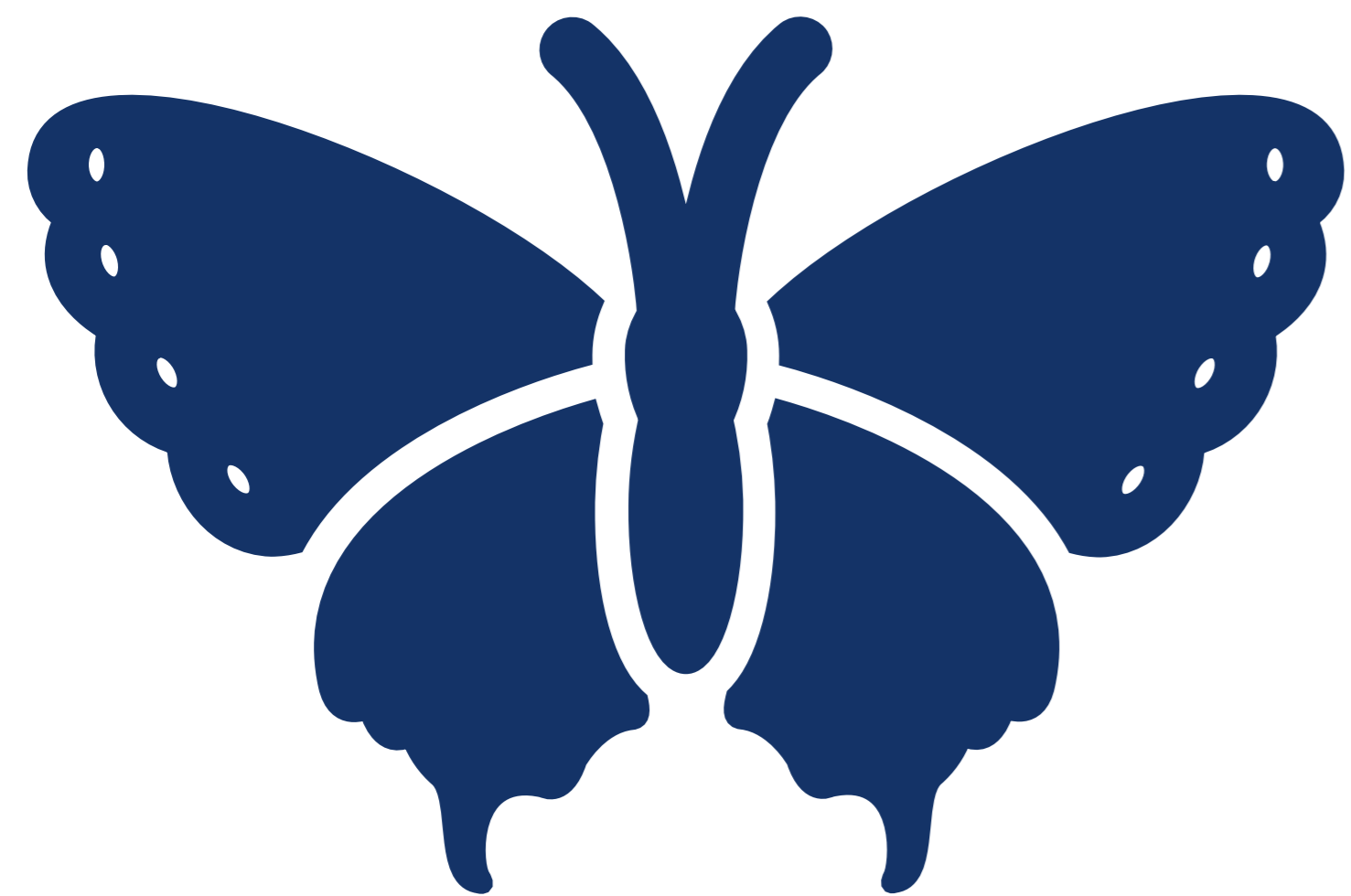
## Perception That Physical Science Is Not Amenable to Environmental Literacy

- ❖ May be a broader outcome of some teachers' general discomfort with physical science compared to life or earth science.



I don't think of environmental ed as integrated into anything other than the earth and life sciences.

– Teacher



**A challenge is scheduling lessons when certain phenomena are happening in the natural world — the monarch butterfly migration, ladybug hibernation, or maple leaves turning color.**

– Teacher

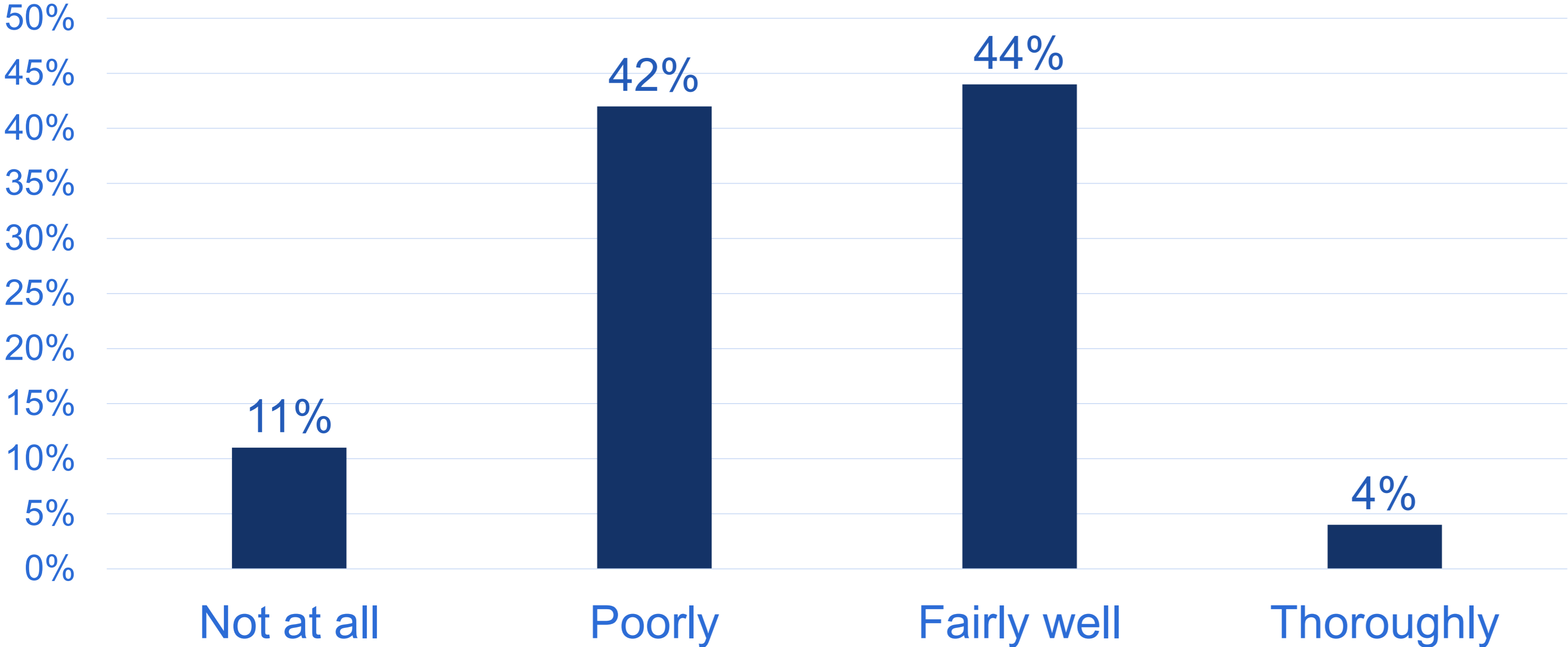


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# Challenges That LEAs May Face

1. **Environmental literacy is new to many teachers.**
2. **Some teachers consider environmental literacy as an add-on.**

# How well would you say you understand how to address environmental literacy in a science unit?



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## Perception That Environmental Literacy Is Something Else to Learn on Top of the NGSS

❖ **In interviews, evaluators encountered overload concerns among teachers.**

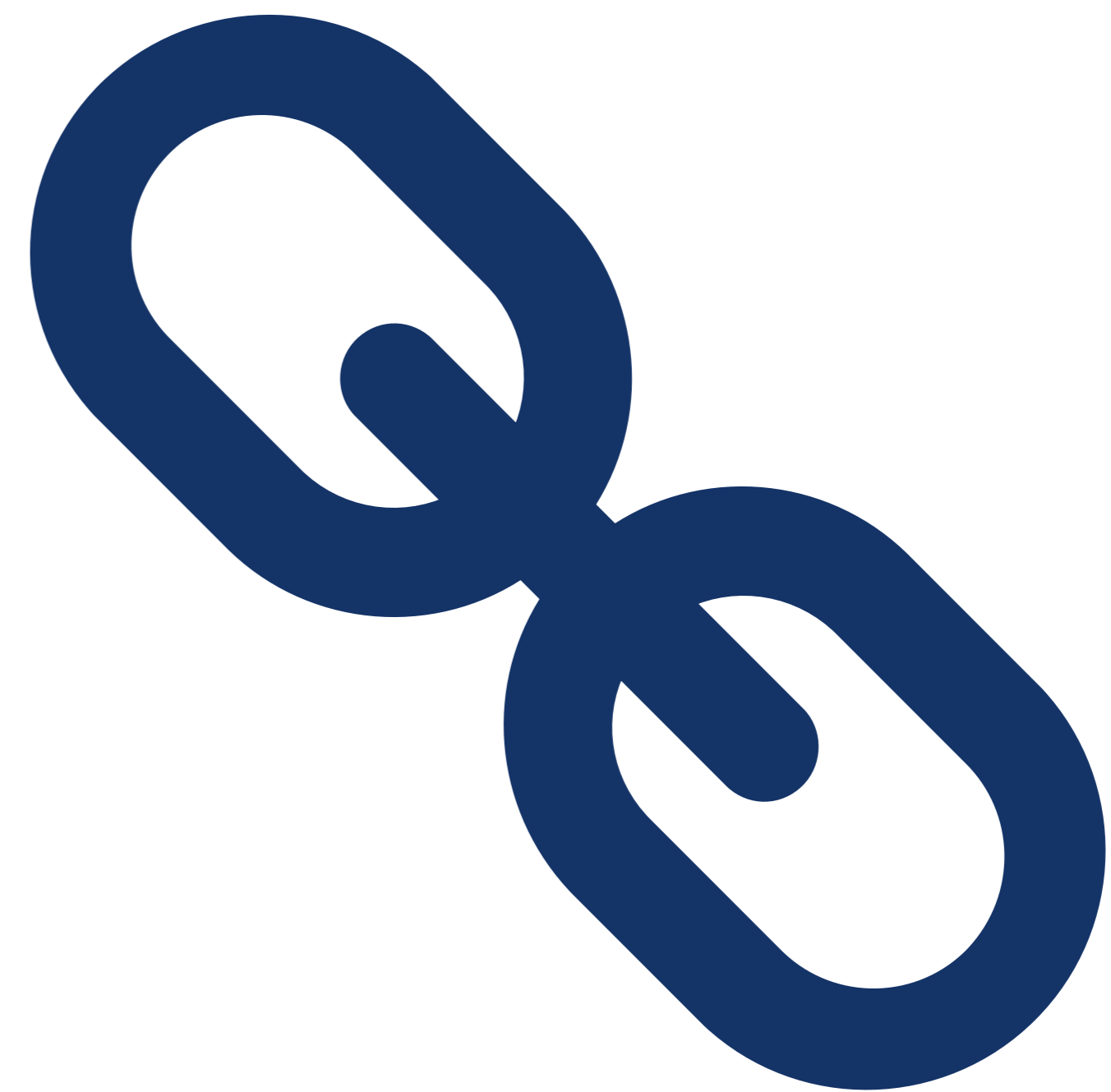
❖ Specifically, NGSS teaching is viewed as the priority and other topics are perceived to be secondary.



I mean, right now, it just seems like [the EP&Cs are] another thing that I have to think about . . . I'm just barely trying to get a grasp of NGSS itself. I mean, I do talk about environmental topics in the units, but I haven't cross-referenced with the new environmental stuff to make sure that I'm including everything that needs to be talked about in there.

– Teacher

# Links to Resources





- ❖ **Tool for Educators: Environmental Identity Classroom Reflection Middle School**
- ❖ **Resources for Outdoor Science Programs: BEETLES**
- ❖ **Early Implementers Initiative: Environmental Literacy Report**

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## Selected References and Resources

California Department of Education. (2016). [Appendix 2 Connections to Environmental Principles and Concepts.](#)

California Department of Resources Recycling and Recovery. (2018). [California's Environmental Principles and Concepts.](#)

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Thank you!

# QUESTIONS?



**THANK YOU FOR JOINING US TODAY.**

