

# Thriving Schools: Using Outdoor and Environmental Learning

## A Roadmap for Schools and Districts

### Introduction

Environmental and outdoor learning, with its focus on **hands-on learning** and **authentic problem solving** can transform education and create safe and healthy schools. When the spread of a novel coronavirus forced the closure of schools across the country in spring of 2020, educators began to explore a multitude of strategies for a safe return to in person learning for students, teachers, and staff. Among the success stories were schools that did what might appear to be one of the most obvious things they could do—**they took learning outdoors.**

Today, we continue to see stories of individual classes, schools and even entire school districts benefiting from outdoor learning for all or part of the school day. These learning strategies are a way to grow and strengthen our education system to nurture a range of skills and interests, help realize every student's unique potential, and prepare for whatever the future brings.

Using the outdoors as a context for learning across the curriculum is proven to promote not just academic success, but **enhance critical thinking, collaboration, and leadership skills.**

Environmental and outdoor learning **supports students' social emotional learning**, including more differentiated instruction, project-based learning, and providing more space for student voice and choice—all key to helping students develop a sense of agency and confidence.

**It's time to prioritize environmental and outdoor learning during the next school year and beyond** and develop strategies to help students thrive. We have an opportunity to accelerate efforts to ensure every student gets to benefit from outdoor learning experiences every day.



The following are specific, **evidence-based recommendations** for using outdoor and environmental education to enhance school and district efforts to address the academic, social and emotional needs of students while maintaining safe and healthy learning environments:



- Annual Student Field Experiences
- Weekly Green Schools Activities
- Daily Use of Outdoor Classrooms
- Ongoing Professional Learning for Teachers
- Ongoing Outdoor Education Staffing





### Field Experiences

-  Promotes environmentally responsible behaviors (Zint et al. 2002).
-  Narrows the achievement gap in young people from low-income and high-income families (National Research Council, 2015).



 **At least one experience annually**

### Green School Activities

-  Leads to positive effects on critical thinking and lifelong learning (Kilgo, Ezell Sheets, & Pascarella, 2015).
-  Greener schools are healthier schools, which can result in reduced absenteeism, especially for asthma related absences, the leading cause of absenteeism (Gordon, 2010).

 **At least once a week**

### Outdoor Classrooms

-  Outdoor classrooms refuel students for learning when they return to their regular classrooms (Kuo, Browning, & Penner, 2018).
-  Students who learn in outdoor settings become better thinkers (O'Brien & Adam, 2016).

 **Every day**

### Coordination & Support

Complement investments in outdoor classrooms, field experiences, and green schools practices by creating or expanding additional staffing resources to support effective implementation of outdoor and environmental education.





## Sustaining Success: Staffing & Coordination

To complement investments in outdoor classroom spaces, field experiences for students, and green schools practices, education agencies should consider creating or expanding additional staffing resources to support effective implementation of outdoor and environmental learning. Establishing a state-wide Environmental Literacy Coordinator would allow State Educational Agencies (SEAs) to take a holistic approach to environmental education, take stock of where environmental education can be integrated into the curriculum at every grade level in ways that support student success, and support Local Education Agencies (LEAs). **Outdoor learning specialists** at the school district level can provide localized curricular connections, additional instructional capacity for individual schools, and ongoing professional development and mentoring for teachers in using outdoor learning spaces and connecting outdoor experiences to classroom instruction.

**Building in staffing supports for environmental literacy and outdoor learning at the state and district levels creates infrastructure for sustained success and deeper integration of regular and meaningful opportunities for students to learn outside.**

## Power Up Learning through Field Experiences

Learning happens all the time, everywhere. Gardens, zoos, nature centers and other sites of environmental education are like charging stations that can power up kids' learning back in the classroom. Some schools and students benefit from "high-wattage" areas that provide many energizing opportunities, while other students have few options to plug into. A patchy and unreliable grid means our education system is not as strong as it could be, but we can rewire it to eliminate dead zones and boost learning outcomes for everyone. By connecting to an extensive circuitry of environmental and outdoor learning sites that provide field experiences during the school day or out-of-school time experiences like after school clubs or summer camps, schools and districts can help ensure that the **knowledge and skills students gained in one place can easily flow into new contexts, powering further exploration and boosting ongoing learning.**

### Recommendations:

- Ensure that every PreK-12 student, no matter where they live, experiences at least one environmental and outdoor field experience every year.
- Ensure that every Prek-12 student has opportunities to participate in outdoor and environmental summer and after school learning experiences to boost learning back in the classroom.



### Evidence Base for Field Experiences

There is an extensive evidence base that shows when we boost kids' learning with frequent opportunities to explore their environment and communities, we can overcome learning loss and nurture a range of skills and interests that will prepare them for whatever the future brings.

Among the many potential outcomes, research has shown that **field experiences** during school time, summer, and after-school:

- Expose students to new experiences and can **increase interest and engagement in science** regardless of prior interest in a topic ([Kisiel, 2005; Bonderup Dohn, 2011](#)),
- Result in affective gains such as **more positive feelings toward a topic** ([Csikszentmihalyi & Hermanson, 1995; Nadelson & Jordan, 2012](#)).
- Are experiences that can be recalled and remain useful long after a visit ([Salmi, 2003; Falk & Dierking, 1997](#)).
- **Boost student's retention of ecological knowledge** longer than those students using conventional curricula. ([Farmer, J. Knapp, D., & Benton, G. M. 2007](#))

Among the many potential outcomes, research has shown that **out of school time experiences**:

- In STEM programming, which includes environmental education, led to a narrowing of the achievement gap between young people from low-income and high-income families, better attendance, and more enthusiastic participation in school with consistent participation. ([National Research Council, 2015](#))
- Provide effective strategies in promoting environmentally responsible behavior in the short, medium, and longer terms by providing multiple experiences over extended periods of time and coordinating with other experiences. ([Zint et al. 2002](#)).
- Enhance learning through first-hand experience with phenomena and materials ([National Research Council, 2015](#)).

## What are the Key Components for Success?

**Classroom Integration:** To be effective, field experiences need to be connected to what is already occurring in the classroom. They should be anchored to state academic standards and support goals for learning and/or student achievement. They are not meant to be something extra, but rather an educational approach that helps meet learning objectives. They can provide authentic, engaging interdisciplinary learning that crosses traditional boundaries between disciplines.

**Active Educator Support during Field Experiences:** Educators help students make connections and draw on past learning, serve as environmental role models, and ensure that the essential elements of the field experiences come together to support goals for learning. Even when environmental educators or other professionals are leading elements of the field experience, educators should be actively engaged in answering questions and relating the experience back to the classroom. To support this level of engagement, teachers should have access to professional development opportunities that support their content knowledge and confidence and intention to make connections with classroom learning.

**Local Context and Phenomena:** Field experiences use the local environment and community as a context for learning. Situating the field experience within local contexts promotes learning that is rooted in the unique culture, history, environment, economy, literature, and art of a students' school, neighborhood, town, or community. Partnerships, such as those with local community based organizations, allow students to engage with members of their community of diverse cultures, values, and expertise for a more equitable and inclusive experience. Emphasizing local contexts and phenomena enables students and teachers to develop stronger connections and appreciation for their local environments and communities.



**Sustained Learning Experience:** Field Experiences have multiple opportunities to engage students from beginning to end. Each essential element builds upon and reinforces learning spread over the course of a unit or multiple units. All students should have the opportunity to participate in and benefit from each essential element.

Key Components for Success are Adapted from Practices Developed by [NOAA](#)

## How?

Budget funding to allow every PreK-12 student to participate in at least one environmental and outdoor field experience annually.

- Field Experiences: #Students x (\$X/student bus fee + \$X/student program fee)
- State Level: E.g. 800,000 Colorado Students x (\$15/student bus fee +\$25/student program fee)= \$32 Million or 355,000 students eligible for free and reduced lunch x (\$15/student bus fee +\$25/student program fee)=14.2 million
- District Level: 50,000 Students x (\$15/student bus fee +\$25/student program fee)= \$2 Million or 22,000 students eligible for free and reduced lunch x (\$15/student bus fee +\$25/student program fee)=\$880,000
- Program Fees will vary based on length and intensity. The program costs above were estimated at \$5/student/hour x 5 hour experience. Summer camps may be anywhere from \$250-\$1200 per week. After school experiences may be estimated at \$100-150 for 6 weeks.
- Consider adding substitute teaching costs: ~\$75-\$100/day
- Consider partnering with environmental and outdoor learning providers on funding initiatives.

## Energizing Students and Schools with Green Schools

There is an opportunity to not just improve learning, but also improve student health and safety through implementation of Green Schools programs in schools and districts. In the broadest terms, Green Schools are those which engage students, teachers, staff, parents and community members to investigate their school's environmental footprint and work collaboratively to make improvements. Exploring energy, waste and recycling, water, the schoolyard and school health offers multiple entry points for reading, writing, math, and science as well as opportunities to develop civic engagement skills in students. Having students lead this work provides an opportunity for development of soft skills like **collaboration and cooperation, critical thinking, problem solving, and leadership**, while providing students with **real world and relevant learning opportunities**. In the process, **schools save money** and are **healthier and more productive** places to learn and work. Also, many state and national programs offer recognition for this work to schools, including the [U.S. Department of Education's Green Ribbon Award](#).

## Recommendations

- Ensure that every school engages students in leading activities to become a greener and healthier school.
- Ensure that every PreK-12 student, no matter where they live, participates in some aspect of Green Schools work at least once a week.



## Evidence Base for Green Schools

Students who are engaged in Green Schools are doing real world, problem-based learning, which benefits both student academics and health and can save schools money. The following are some key findings on engaging students to lead the way for greener and healthier schools:

- Engaging students in Green Schools investigations and action planning affords the same benefits as well designed problem-based learning, including: **increases long-term retention of content**, helps students **perform as well as or better than traditional learners in high stakes tests**, **improves problem-solving and collaboration skills**, and **improves students' attitudes toward learning** ([Strobel & van Barneveld, 2009](#); [Walker & Leary, 2009](#)).
- Engaging students in Green Schools investigations provides a context for real world learning, which is tied to positive effects on **critical thinking and lifelong learning** ([Kilgo, Ezell Sheets, & Pascarella, 2015](#)).
- Because of the collaborative nature of Green Schools, implementation in schools will facilitate cooperative learning opportunities for students, which "is itself an environment in which social skills are acquired or improved; this is mainly due to the key role played by social interaction in the **development, not only of academic intelligence, but also social intelligence**" ([Polo del-Rio & Iglesias Gallego, 2017](#)).
- **Improvements to the school setting**, such as addressing daylighting has shown **positive impacts on student performance**. For instance, a 2002 study found "statistically significant effects of daylighting on human behavior, as evidenced in the standardized test scores for elementary school students" ([Heshong, Wright and Okura, p. 110, 2002](#)).
- Making schools more energy, water and waste efficient can result in **savings for schools**, sometimes in the tens to hundreds of thousands annually ([Gordon, 2010](#)).
- Greener schools are healthier schools, which can result in **reduced absenteeism**, especially for asthma related absences, the leading cause of absenteeism ([Gordon, 2010](#)).

## What are the Key Components for Success?

**District wide Student, Teacher, Staff and Community Engagement and Leadership:** While individual schools can engage students, teachers, staff and community members in Green Schools, working at a district level ensures teacher and student leaders have a support system and coordination which allows for larger impacts. At both the school and district level, a key factor for success is the establishment of a Green Schools Leadership Team. The Green Schools Leadership team should include students at all grade levels, teachers, school staff, administrators, parents and community members. It is especially key to engage maintenance and food service staff as they have direct involvement in nearly all the areas students may wish to investigate. Informal education partners, parents and community members can often serve as resource people and support Green School efforts.

**Teacher Professional Learning and Connections to Curriculum:** There are many state and national programs that can provide professional learning opportunities for teachers to learn about Green Schools implementation and connections to curriculum. Green Schools learning is ideal for integrating into existing reading and language arts, math and science curriculum with opportunities to explore concepts ranging from persuasive writing and presentations, collecting and analyzing data, to key elements of energy, water

and human impacts on the environment. Conducted at a district level, professional learning provides opportunities for teachers to collaborate, one of the characteristics identified as necessary for effective professional learning ([Darling-Hammond, Hylar & Gardner, 2017](#)).

**Connecting with State and National Green Schools Programs:** A variety of national and state and local programs that are designed to provide guidance, support and professional learning, as well networking opportunities for students and educators. In addition, many of these programs offer recognition for Green School accomplishments.

## How?

Budget to support Green Schools implementation, coordination and professional learning:

- Materials and Supplies for Green Schools Investigations: \$500 per school (one time cost)
- Professional Learning: # of Teachers x cost of workshop or conference • e.g. 125 educators per district x \$150 = \$18,750
- Green Schools District Coordinator = \$50,000 per district

## Igniting Learning in Outdoor Classrooms and Learning Spaces

Experiences in nature and greater access to the outdoors are associated with **reduced stress, greater mental and physical health, and well-being**. In short, the outdoors serves as a recharging station for many.

The increased safety and benefits to emotional and physical health prompted schools and districts to consider the use of outdoor classrooms, not just as a means to improve health and safety during COVID, but also as a resource that has benefits far beyond the pandemic. **Research demonstrates that outdoor classrooms promote increased interest and motivation to learn<sup>2</sup> and boost academic performance** ([Ardoin, et. al, 2017](#)). The strong evidence-base for the benefits of outdoor classrooms and learning offer an important opportunity for schools and districts to ignite learning which addresses both socio and emotional well-being as well as learning loss.

## Recommendations:

- Ensure that every school develops a multi-functional and accessible outdoor classroom.
- Ensure that every PreK-12 student, no matter where they live, learns in an outdoor classroom for at least one hour a day.





## Evidence Base for Outdoor Classrooms

There is a large and growing body of research that demonstrates the benefits of outdoor learning for mental health and well-being, stress reduction, physical health, student engagement, and academic success. Outdoor classrooms are cost-effective and create unique learning opportunities. The evidence-based outcomes of engaging students in learning in outdoor classrooms includes:

- **Using the outdoor classroom as a context for learning produces academic benefits for ALL students.** In a review of 119 peer-reviewed studies, the following outcomes in multiple studies—these are a few highlighted in this report ([Ardoin, et. al, 2017](#)):
  - Consistently outperformed other schools on standardized tests in math, reading, writing and listening
    - Better performance on state science standards testing
    - Provides students with Attention Deficit Hyperactivity Disorder and other learning differences with opportunities to better understand complex concepts.
    - Reductions in dropout rates and academic failure.
- **Outdoor classrooms refuel students for learning when they return to their regular classrooms.** Not only is the outdoor learning experience effective, it helps “leave students more able to engage in the next lesson, even as students are also learning the material at hand. Such “refueling in flight” argues for including more lessons in nature in formal education” ([Kuo, Browning and Penner, 2018](#)).
- **Students who learn in outdoor settings become better thinkers.** Student learning which takes place in outdoor settings fosters systems thinking, encourages students to become change-makers and choice-makers, and become adaptive in their thinking, able to create models for other contexts ([O'Brien & Adam, 2016](#)).
- **Outdoor classrooms improve student mental health.** Learning in the outdoors helps with improved mental health ([Roe and Ashiphall, 2011](#)), especially for students who are experiencing mental distress, have low perceptions of social and personal skills and for children on the autistic spectrum ([Fiennes, et.al, 2015](#)).

## What are the Key Components for Success?

**Teacher, Staff and Community Engagement:** Having a broad-based team will increase buy in and usability of outdoor classrooms. This team should also include maintenance staff and if incorporating gardens for growing food, food service staff. Community engagement can provide support for creating and maintaining outdoor classroom spaces.

**Design for Learning:** Having your planning team consider who might use the space, how they might use the space and what learning opportunities could take place in the outdoor classroom space is critical for the place and design of the outdoor classroom space(s). For instance, a space that is relatively quiet might be ideal for creative writing and reading, while a space near gardens might be best used for science or art. Consider how the space could be best used—is there ample room for movement for more active learning, or could multiple groups use the space at the same time? How many students could be accommodated in the space, and what seating and shade/shelter would be needed for different learning uses (e.g. if students need to see a white board, is the area shaded or free of glare)? Learning will be successful in outdoor classrooms if these considerations are addressed.





**Teacher Professional Learning and Connections to Curriculum:** Teaching in an outdoor classroom can be highly engaging and rewarding for teachers and students. However, teaching and learning outdoors can be a new experience for both teachers and students, and professional learning can help teachers learn pedagogy and management strategies appropriate for outdoor learning. Just about any subject can be taught in an outdoor classroom with little adaptation. Outdoor classrooms also provide unique learning opportunities. Here are some examples:

- Exploring weather
- Looking for patterns
- Observing phenomena
- Mapping and topography
- Sorting and classifying natural objects
- Learning about wildlife and habitat
- Exploring environmental issues
- Learning about plant, plant growth and cycles



With planning and preparation, students can not only have engaging and meaningful learning opportunities, they can also experience all the benefits of learning outdoors on their academic performance, attention, engagement and physical and mental health.

## How?

Budget funding to support the development and coordination of outdoor classroom space and professional learning:

- Materials and supplies for Outdoor Classroom: \$5000-\$10,000 per space (one time cost)
- Professional Learning: # of Teachers x \$150, e.g. 125 educators per district x \$150 = \$18,750
- Outdoor Classroom Coordinator = \$50,000 per district

## Supporting Outdoor Experiences with Teacher Professional Learning

PreK-12 teachers support students everyday. Teachers spark excitement about learning for their students, provide support for mental and physical health, address challenges students may be facing at home, and create welcoming and safe learning environments. Teachers are also learners themselves. PreK-12 teachers need access to quality professional learning experiences to support their students by taking full advantage of utilizing the outdoors as a classroom.

Professional learning can take many forms, including virtual, hybrid and in-person courses, ranging from a few hours to multiple days. Teachers can be further supported through implementing communities of



practice, working with mentors and community partners. These professional learning opportunities can assist teachers in meeting state educational requirements in multiple subject areas while also providing the necessary support to bring learning outdoors, further enriching the school day experience for their students.

### Recommendation:

- Ensure that every PreK-12 teacher, no matter where they live, participates in at least one professional learning experience to support environmental and outdoor education.



### Evidence Base for Professional Learning

There is evidence that shows when teachers participate in professional learning they implement new practices in their classrooms. For professional learning to be effective, it must:

1. Be content focused
2. Incorporate active learning
3. Support collaboration
4. Use models and modeling of effective practice
5. Provide coaching and expert support
6. Offer opportunities for feedback and reflection
7. Be of a sustained duration ([Learning Policy Institute, 2017](#))

Among the potential outcomes, research has shown that participation in professional learning:

- Motivates and inspires teachers, and adding a mentoring component provides the tools, confidence, and contextualized support to be able to implement environmental education. ([citation](#))
- Increases teachers' content knowledge, which can then be implemented in the classroom ([Buczynski, Sandy; Hansen, C. Bobbi, 2010](#))
- May improve student outcomes if professional learning integrates content learning with analysis of student learning and teaching ([Heller JI, Daehler KR, Wong N, Shinohara M, Miratrix LW., 2012](#))
- Professional learning increases teacher content knowledge in a subject area and participating in a professional learning workshop has significant relationship with how often that subject is taught ([Sara Hendrickson Velardi, Elizabeth Folta, Laura Rickard & Diane Kuehn \(2015\)](#))
- Preparation for teaching outdoors, including the opportunity for reflection, yields a positive outdoor teaching experience. ([Tal, T., Morag, O., 2009](#))

### What are the Key Components for Success?

**Classroom integration:** Environmental and outdoor education professional learning opportunities should connect to what is already occurring in the classroom. They should be anchored to state and national academic standards and support goals for learning and/or student achievement. They are not meant to be something extra, but rather an educational approach that helps teachers meet their learning objectives. They can provide authentic, engaging interdisciplinary learning that crosses traditional boundaries between disciplines.

**Utilizing Partners:** Many community partners deliver quality professional learning that can meet the needs of classroom educators and relevant state standards. Zoos, aquariums, nature centers and [North American](#)



[Association for Environmental Education Affiliates](#) may provide regular professional learning in your district or state with an emphasis on outdoor learning. Working with external partners on developing professional learning for educators may also lead to additional learning opportunities for K-12 students, including outreach and field experiences.

**Long-Term learning:** In addition to participating in professional learning opportunities, teachers should have the ability to connect with mentors, a community of practice or external support. Research indicates that when teachers have these external supports, they are more likely to integrate the practices they have learned in a professional learning course into their classroom.

**Incentives to participate:** Teachers attending a professional learning offering should be supported by their school and/or district. Incentives to participate may include utilizing contract hours for professional learning, offering a stipend or credits for relicensure, including principals and other school administrators in learning opportunities, and providing resources for implementing new strategies.

**Developing skills:** Professional learning for teachers on outdoor and environmental education should include content knowledge in addition to the best practices and methods for bringing instruction outdoors.

## How?

Budget funding to provide every PreK-12 educator with at least one environmental and outdoor professional learning opportunity annually.

- Costs of teacher professional learning programs vary by provider. To calculate cost for a specific program or provider, use the following formula:
- Number of Educators X Cost Per Person = Total Cost
- *Example: In Utah, Project Learning Tree educator professional development is \$40/teacher. There are approximately 300 K-8 teachers in the Salt Lake City School District. Professional development for this district would total \$13,200*