



2012



KEEP Colorado Environmental Education Plan



Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has.

~ Margaret Mead



Colorado Environmental Education Plan:

Leveraging Resources to Advance Environmental Literacy

Developed by



COLORADO
Department of Education



COLORADO
Department of Natural Resources



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The Colorado Environmental Education Plan is made possible by the hard work of the Colorado Alliance for Environmental Education, the support of many local organizations and businesses, and the input of over 600 Coloradans.

Keep close to Nature's heart... and break clear away, once in awhile, and climb a mountain or spend a week in the woods. Wash your spirit clean.

~ John Muir



Table of Contents

Executive Summary	6
Colorado's Current Landscape	8
Environmental Literacy	10
Environmental Education Theory of Learning	11
The Purpose of the Colorado Environmental Education Plan	12
Vision, Mission, Goals	13
Meeting the Goals	14
Establishment of the Colorado Environmental Leadership Council	15
Proposed Timeline	18
Strategies for Collaboration	19
Institutionalizing Environmental Education	22
Conclusion	25
Appendix A: The Colorado Kids Outdoors Grant Legislation	27
Appendix B: Environmental Education in the Colorado Academic Standards	28
Appendix C: Environmental Education in Action	40
Appendix D: Criteria for Quality Professional Development	44
Appendix E: Ensuring Quality in Environmental Education Materials	45



Executive Summary

Colorado students need to be prepared to address present and future environmental challenges and innovations that impact quality of life. Colorado’s environment, economy, and communities depend on informed citizens who can make decisions about air and water quality; the health of farms, ranches, forests and wildlife; how to meet energy and other resource needs; how to create and sustain healthy communities; and how to provide opportunities for residents to partake in the state’s natural beauty while protecting it for future generations.

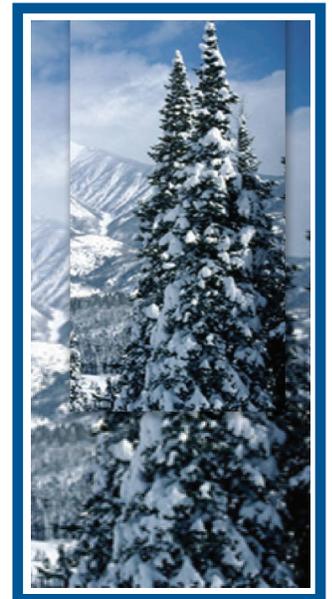
Colorado Kids Outdoors Grant Program Legislation, HB10-1131, was signed into law in May 2010. This bill recognizes the importance of the outdoor environment on the health of the state’s residents, especially Colorado youth. This legislation requires the State Board of Education to adopt a statewide plan for environmental education. Beginning in the spring of 2011, in partnership with the Colorado Department of Natural Resources (DNR), the Colorado Department of Education (CDE) developed the Colorado Environmental Education Plan (CEEP) to foster the partnerships and awareness needed to promote, coordinate, and sustain standards-based environmental education across the state.

6



This Colorado Environmental Education Plan outlines strategies for building a feasible, cost effective, and sustainable infrastructure to support the education of an environmentally literate citizenry. Developing and implementing a statewide environmental education plan depends on CDE and DNR leveraging existing partnerships with teachers, administrators, families, community members, community organizations, business owners, non-profits, and governmental leaders to develop a visible, accessible, and feasible network for environmental education. The adoption of this plan sets the stage for the vision articulated in HB 10-1131 for coordination and cooperation among schools, districts, and community partners.

The purpose of this document is to leverage resources to advance environmental literacy. The Colorado Environmental Education Plan is designed to support implementation of the Colorado Academic Standards while developing students’ knowledge and skills related to the environment and getting students to spend more time outside. The timing of this plan is advantageous as districts, schools, and teachers are revising curricula and improving instructional practices to address the strategic imperative of developing all students’ postsecondary workforce readiness. The strategies outlined in this plan support teachers by encouraging the integration of high quality environmental education opportunities and use of the outdoors in ways that are relevant, connected, and meaningful for their students.



The Colorado Environmental Education Plan Articulates Three Main Goals:

1. PREPARE STUDENTS TO UNDERSTAND, ANALYZE AND ADDRESS THE MAJOR ENVIRONMENTAL CHALLENGES FACING COLORADO, THE UNITED STATES AND THE WORLD:
 - a. *Promote and strengthen existing environmental education networks through partnerships and collaboration;*
 - b. *Design and implement on-line resources to connect providers with districts and schools; and*
 - c. *Provide teachers and students access to research-based data, content and resources.*

2. CONNECT TEACHERS AND STUDENTS TO STANDARDS-BASED, RELEVANT, ENVIRONMENTAL EDUCATION EXPERIENCES IN AN EFFORT TO DEVELOP LIFELONG HEALTH, WELLNESS AND CIVIC MINDED BEHAVIORS:
 - a. *Coordinate existing tools and resources with districts, schools and teachers for implementation of quality field experiences as part of the curriculum; and*
 - b. *Increase awareness of and access to place-based education opportunities for teachers and students.*

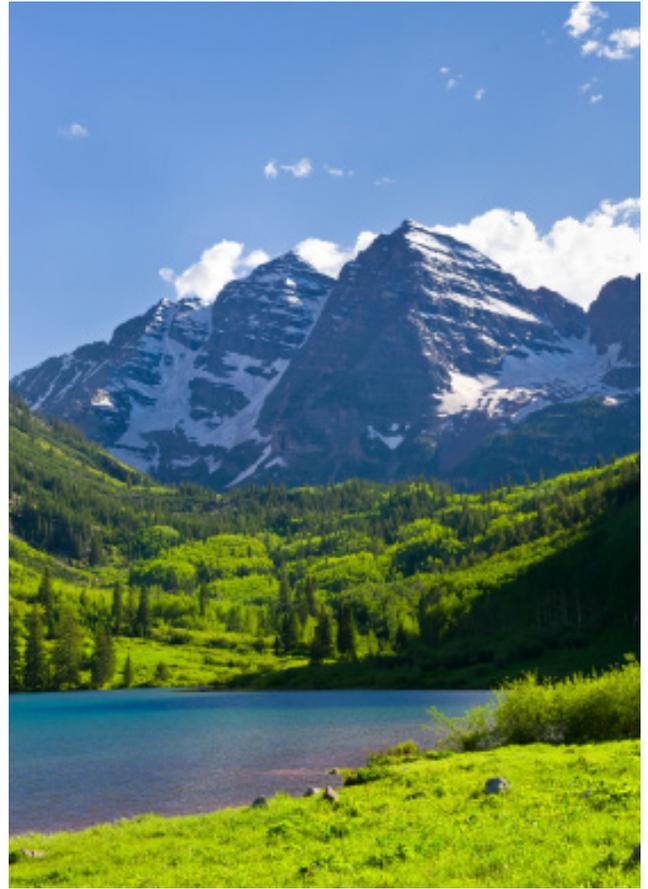
3. CONNECT SCHOOL DISTRICTS AND TEACHERS TO PROFESSIONAL DEVELOPMENT OPPORTUNITIES IN ENVIRONMENTAL EDUCATION:
 - a. *Increase teachers' content knowledge; and*
 - b. *Improve teachers' pedagogical content knowledge and skills, including the use of:*
 - i. *Interdisciplinary, place-based and research-based instructional strategies;*
 - ii. *Innovative technologies as an integral element of environmental education; and*
 - iii. *Concept-based approaches that underpin environmental education principles.*

The plan aims to build on Colorado Department of Education's and Department of Natural Resources' existing strategic priorities by providing a vision for environmental education that is based on the Colorado Academic Standards, supports high quality research-based environmental education curriculum and instruction, and fosters outdoor recreation and stewardship.



Colorado's Current Landscape

Colorado's natural environment is world-renowned. The geographic features, agriculture, mining, recreation, wildlife and other natural resources define Colorado's heritage and are the cornerstone of its economy. As such, Colorado students need to be prepared to address present and future environmental challenges and innovations that impact quality of life. Colorado's environment, economy, and communities depend on informed citizens who can make decisions about air and water quality; the health of farms, ranches, forests and wildlife; how to meet energy and other resource needs; how to create and sustain healthy communities; and how to provide opportunities for residents to partake in the state's natural beauty while protecting it for future generations.



Environment

8 The environment intersects with personal and community lives in multiple ways, therefore, developing an environmentally literate population has the potential to dramatically improve the lives of all Coloradans. With continued human activities exerting increased pressure on Colorado's natural resources, special attention is needed to ensure

Coloradans can make informed decisions about the environment. Building lifelong stewards for Colorado's wealth of natural resources, spaces and lifestyle is critically important. Coloradans will need both the benefits that come from personal and meaningful outdoor experiences, and the knowledge and skills to make informed decisions about the environment. Colorado schools and community providers have the opportunity to promote outdoor recreation, such as hunting, fishing, archery and adventure education, to ensure all students have the opportunity to foster connections and routines in the outdoors.

Economy

The economy of the state and the health and wellness of Coloradans depends on a healthy environment. Colorado's natural environment contributes significantly to the economic health of the state with a multitude of industries built around the use of natural resources. Graduates with a strong foundation in environmental education have a variety of job and career opportunities. Colorado is one of the nation's leaders in promoting the green job industry; the state now boasts nearly 20,000 renewable energy and research jobs, making it the fourth-highest concentration of green jobs in the U.S.¹ Recreation and tourism, such as skiing, hunting, rafting, fishing, wildlife viewing and hiking, provide employment to many of Colorado's residents and represents a

¹ Governor's Energy Office - Recharge Colorado: Green Jobs. (2010). Retrieved September 14, 2011 from http://rechargecolorado.com/index.php/who_is_the_geo/green_jobs/

significant source of income to its state and cities. These industries are vital to the state's economy. National studies indicate that 47% of all natural resource agency field staff and 77% of all leadership staff are expected to retire by 2015, leaving a void in outdoor and science positions in Colorado and across the nation.² These trends suggest that students in environmental education and recreation career pathways will have available job opportunities in the future.

Health and Wellbeing

The decisions made about the environment impact the health and wellbeing of Coloradans through factors such as access to clean air, water, food, energy and open spaces. In addition, the commitment Colorado's citizens have to lifelong health-enhancing physical activity is dependent on the above mentioned environmental factors. Many people move to Colorado for the variety of outdoor physical activities that the environment provides; however, many Coloradans do not have the opportunity to be outdoors and develop a connection and affinity to outdoor physical activities. Nearly one-third of children in Colorado live in neighborhoods without a park, playground, recreation center, trail, or other safe place to play. Between 2003 and 2007 Colorado's number of obese 10-17 year olds rose from 48,000 to 72,000, the 3rd fastest rate of increase nation-wide, dramatically decreasing Colorado's national ranking of children with healthy weight from 3rd to 23rd. If Colorado continues at this rate, an estimated 76% of Coloradans will be

overweight or obese by 2020.³ National research indicates that children spend more than seven hours a day engaged with electronic media⁴ and that, on average, Americans spend 90% or more of their lives indoors.⁵ Conversely, spending time outdoors has demonstrated significant physical and mental benefits, including improving mood and concentration.⁶

Environmental education can help provide young people with opportunities to get outside, enjoy outdoor physical activity, and understand the impact that the environment has on individual and collective health.



2 Unger, K. (Spring, 2007). Graying of the Green Generation. The Wildlife Professional.

3 Colorado Children's Campaign. (2007). Childhood Obesity in Colorado: A Growing Problem. Retrieved January 2011 from www.coloradokids.org/file.../1b7691de-2f68-415c-8164-51ad9eb5db2f

4 The Henry J. Kaiser Family Foundation. (2010). Generation M2: Media in the Lives of 8- to 18-year-olds. Retrieved November 2010 from <http://www.kff.org/entmedia/012010/pkg.cfm>

5 U.S. Environmental Protection Agency. (2011). The Inside Story: A Guide to Indoor Air Quality.

6 Coon, J.T., Boddy, K., Stein, K., Whear, R., Barton, J., & Depledge, M.H. (2011). Does participating in activity in outdoor natural environments have a greater effect on physical and mental wellbeing than physical activity indoors? A systematic review. Environmental Science and Technology

Environmental Literacy

Environmental Literacy is a student’s knowledge, understanding, skills and motivation to make and act upon responsible environmental decisions as individuals and as members of their community. Environmental literacy (the primary and overarching goal of environmental education) is “a learning process that increases people’s knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions...”⁷

Environmental Education is a life-long learning process that increases an individual’s awareness of, relationship with, and dependence on the environment and its systems. Because of the multiple ways the environment intersects with personal and community lives, developing an environmentally literate population has the potential to dramatically improve the lives of all Coloradans. Research indicates that students engaged in environmental education experience numerous benefits including:

- Greater pride and ownership in their community;
- Strengthened sense of empowerment to make a difference in their community;
- Increased engagement and enthusiasm for learning;
- Increased school attendance;
- Greater sense of relevance and interest in what they learn in school;
- Better performance on standardized measures of academic achievement in reading, writing, math, science, and social studies.⁸

Environmental Education embodies 21st century skills (i.e., critical thinking and reasoning, invention, self-direction, collaboration, and information literacy) by developing learners’ ability to ask questions, speculate and hypothesize about the world around them, connect to the places where they live, seek information and develop answers to their questions. Learners engage in inquiry, master fundamental skills for gathering and organizing information, interpret and synthesize information to develop and communicate explanations, and invent solutions. Engaging students in rich and varied learning environments has the potential to make learning relevant, interactive, and foster place-based connections.

ENVIRONMENTAL EDUCATION

in Colorado involves a wide variety of subjects including: science; social studies; mathematics; physical education; reading, writing and communicating; health; and visual arts.

ENVIRONMENTAL EDUCATION

topics can include agriculture, natural history, climate, outdoor adventure, outdoor recreation, wildlife recreation and biology, geography, forestry, green-school efforts, energy and water conservation, waste reduction, geology, recycling, and so many more.

ENVIRONMENTAL EDUCATION

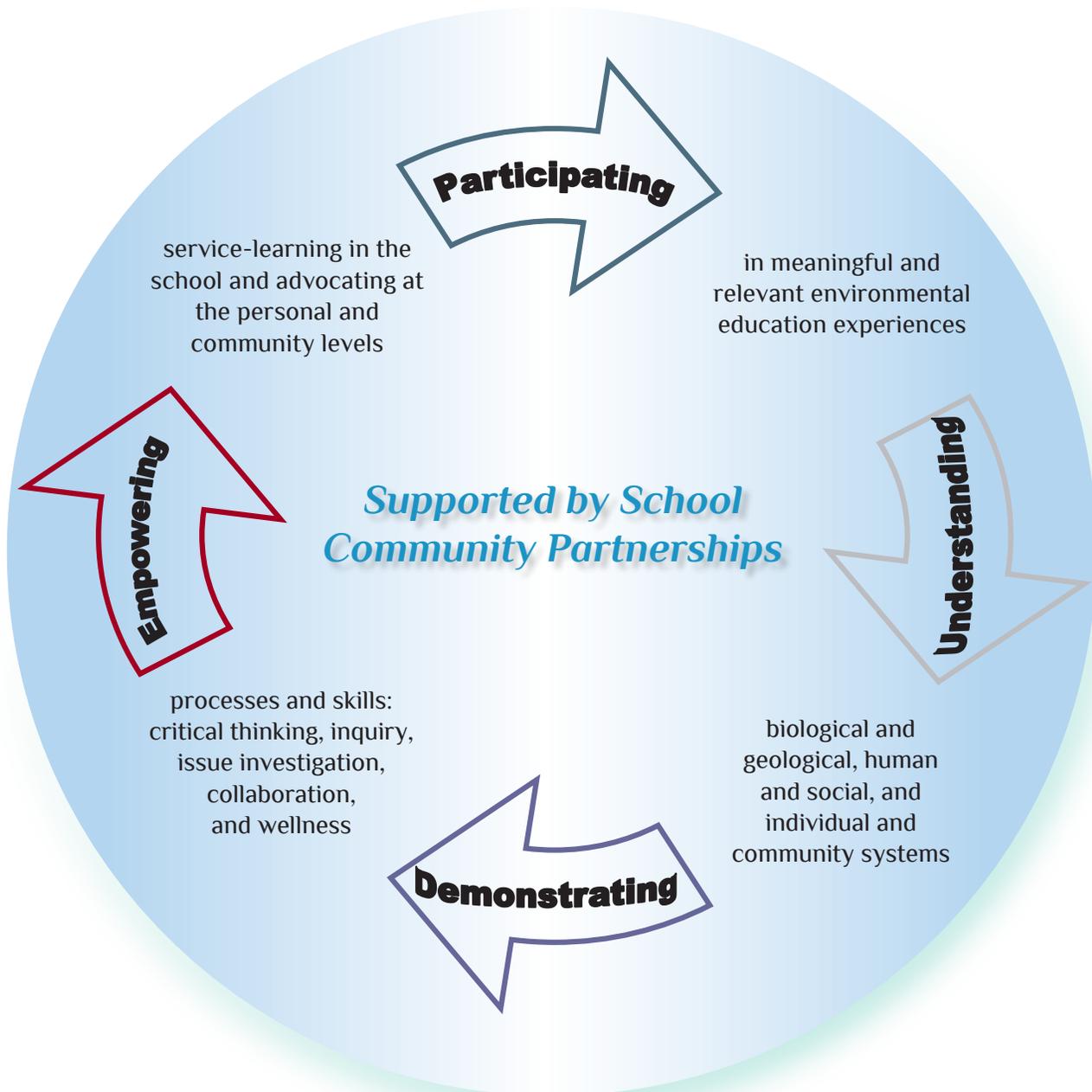
is provided by classroom teachers, child care providers, community non-profits, government agencies, camps, zoos, museums, businesses, and families.

EXAMPLES OF ENVIRONMENTAL EDUCATION

programs are found throughout this document and represent only a fraction of the opportunities that already exist for Colorado students, teachers and families.

⁷ Archie, Michele L. (2003). *Advancing Education Through Environmental Literacy*. Danvers, MA: Association for Supervision and Curriculum Development.

⁸ Lieberman, G. & Hoody, L. (1998). *Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning*. Results of a Nationwide Study. Education and Environment Roundtable. Retrieved December 2010, from <http://www.seer.org>; National Environmental Education & Training Foundation. (2000). *Environment-Based Education: Creating High Performance Schools and Students*. Retrieved from http://www.pecworks.org/PEEC/PEEC_Research/S001877D2-00187940; Ernst, J.A. & Monroe, M. (2004). The effect of environment-based education on students’ critical thinking skills and disposition toward critical thinking. *Environmental Education Research*, 10(4): 507-522.



This diagram illustrates a theory of learning for how students experience environmental education and achieve environmental literacy. This cycle depicts the four key phases of environmental education: participating, understanding, demonstrating, and empowering.

Given meaningful, relevant and connected experiences, students will gain the knowledge and skills to become responsible and productive stewards of the environment.

The Purpose of the Colorado Environmental Education Plan

The Colorado Environmental Education Plan outlines strategies for developing a coordinated and visible statewide environmental education infrastructure. This structure will facilitate students' access to and time spent in the outdoors; and aims to link teachers with environmental education opportunities and resources that engage students in mastering the Colorado Academic Standards. In addition to outlining strategies for a statewide infrastructure, this document provides strategies for implementation at the local level. Finally, this plan is intended to inform the Colorado Kids Outdoors Advisory Council's criteria for the grant program established by HB 10-1131 (Appendix A).

As a local control state, the 178 Colorado school districts and their school boards make public education decisions such as setting local curriculum and local graduation requirements. Therefore, the integration of environmental education into educational experiences for students varies widely across the state. To best meet the diverse needs of local districts, this plan seeks to leverage resources necessary for supporting the implementation of Colorado Academic Standards related to environmental education (See Appendix B).

This plan also aims to build on Colorado Department of Education existing strategic priorities by providing a vision for environmental education in the state that is based on the Colorado Academic Standards and supports high quality, research-based environmental education curriculum and instruction. This plan articulates an infrastructure for leveraging and coordinating existing community resources with local districts, schools, and teachers.

12

BUILDING COMMUNITY PARTNERSHIPS

For over 30 years, the Aspen Center for Environmental Studies (ACES) has worked in partnership with the Aspen School District (ASD). ACES educators provide students in grades kindergarten through fourth grade with in-school environmental education opportunities every week building lasting relationships with students and teachers. The curriculum is designed like an ecology textbook, building a foundation with local plants and animals and moving towards broader concepts of adaptations, natural community roles, and our impact on the environment.

Field programs at ACES nature preserve directly corresponds with students' in-school environmental education curriculum. "The Aspen School District's long-standing relationship with ACES has allowed K-4 students to have experiences that foster the development of knowledge, skills, and attitudes required to be environmentally literate. ACES's programs provide students with the opportunity to analyze environmental issues, engage in problem solving, and take action to sustain and improve the environment. As a result, Aspen students are more capable of weighing various sides of an issue to make informed and responsible decisions." shares Dr. John Maloy, Superintendent of Schools, Aspen School District.

Vision, Mission, Goals

Vision

All Colorado's pre-K – 12 students will have access to high quality environmental education opportunities both in the classroom and outdoors.

Mission

The Colorado Environmental Education Plan serves to connect Colorado's school districts, environmental education providers, and community organizations in order to collaborate and leverage existing resources that develop students' environmental literacy.

Goals

The Colorado Environmental Education Plan articulates three main goals for state agencies, school districts, schools, teachers, and community organizations:

- 1. Prepare students to understand, analyze and address the major environmental challenges facing Colorado, the United States and the world:**
 - a. Promote and strengthen existing environmental education networks through partnerships and collaboration;
 - b. Design and implement on-line resources to connect providers with districts and schools; and
 - c. Provide teachers and students access to research-based data, content and resources.
- 2. Connect teachers and students to standards-based, relevant, environmental education experiences in an effort to develop lifelong health, wellness and civic minded behaviors:**
 - a. Coordinate existing tools and resources with districts, schools and teachers for implementation of quality field experiences as part of the curriculum; and
 - b. Increase awareness of and access to place-based education opportunities for teachers and students.
- 3. Connect school districts and teachers to professional development opportunities in environmental education:**
 - a. Increase teachers' content knowledge; and
 - b. Improve teachers' pedagogical content knowledge and skills, including the use of:
 - i. Interdisciplinary, place-based and research-based instructional strategies;
 - ii. Innovative technologies as an integral element of environmental education; and
 - iii. Best practices that underpin environmental education principles.



Meeting the Goals

The implementation of the Colorado Environmental Education Plan is primarily the responsibility of the Colorado Department of Education. However, this plan's success is dependent on strong partnerships with the Colorado Department of Natural Resources and other environmental education partners.

Preparing students as critical thinkers and informed decision-makers about the environment involves a collaborative effort as environmental education is woven through the work of educators, administrators, families, community members, business owners and governmental leaders. Opportunities exist in rural, urban and suburban locales, and within many cultural contexts. In addition, learning experiences at state and regional historic sites, local museums, and on local school grounds, also provide invaluable opportunities to engage students in interacting with the environment. Success of this plan relies on collaboration of many groups and organizations. Listed below is a brief description of the role that CDE and DNR will play in supporting this plan.

ROLES

Colorado Department of Education:

- Present CEEP to the Colorado State Board of Education for approval
- Provide staff liaison to Colorado Environmental Education Leadership Council
- Raise awareness of the Colorado Environmental Education Plan
- House the Colorado Environmental Education Plan on the CDE web site
- Look for ways to integrate Colorado Environmental Education Plan into other Colorado Department of Education initiatives
- Disseminate the Colorado Environmental Education Plan to education networks
- Provide ongoing technical support to the Colorado Environmental Education Leadership Council

Department of Natural Resources:

- Provide staff liaison to Colorado Environmental Education Leadership Council
- Raise awareness of the Colorado Environmental Education Plan
- Link to the Colorado Department of Education's Environmental Education Plan webpage from the Department of Natural Resources and Colorado Parks and Wildlife web sites
- Look for ways to integrate Colorado Environmental Education Plan into other Department of Natural Resources initiatives
- Disseminate the Colorado Environmental Education Plan to education networks
- Provide ongoing technical support to the Colorado Environmental Education Leadership Council



Establishment of the Colorado Environmental Education Leadership Council

Within this plan is a proposal to create a leadership council as a collaborative group charged with implementing the vision and mission of the CEEP. To form this group the Colorado Department of Education will release a request for interested parties to manage the Colorado Environmental Education Leadership Council (CEELC). The Colorado Department of Education and Department of Natural Resources will review the requests of interested parties. The request for interested parties will be released and awarded in spring of 2013. The awardee will be responsible for defining the criteria to recruit, staff, and convene the Colorado Environmental Education Leadership Council.

Membership in the Colorado Environmental Education Leadership Council may include members of the statutorily established Colorado Kids Outdoors Advisory Council, as well as key members within the field of environmental education, and representatives from school districts, natural resource industries, recreation organizations, and various others who have a vested interest in environmental education. Successful implementation of the CEEP will require all stakeholders to bring forward their existing resources and expertise to ensure all students have access to high quality environmental education experiences.

Both the Colorado Department of Education and Department of Natural Resources will provide representatives on this council. In addition, membership in this council will include members from across the state representing diverse agencies and various uses of the environment. It is recommended that the Colorado Environmental Education Leadership Council have no more than 15 people representing government, non-government, for-profit, non-profit and business and community leaders. An individual may represent multiple areas and will serve an initial two year term.



The Colorado Environmental Education Leadership Council will be the responsible body for putting the plan into practice. The first task for the Council will be to create a template for regional council development. Once the regional council format is determined, the Council will be responsible for creating and convening the four regional councils. The regional councils will include members from the Colorado Environmental Education Leadership Council as well as representatives from that region. These regional councils will be responsible for assisting the Colorado Environmental Education Leadership Council in carrying out the mission, goals and strategies of the Colorado Environmental Education Plan.

Additionally, the Council will be immediately tasked with connecting the networks of state and community agencies, districts, and schools who work together promoting environmental education and creating resources and professional development opportunities for Colorado's teachers and students. The Council will serve as a support mechanism for the equitable implementation of environmental education opportunities for students throughout the state.

Successful implementation of the Colorado Environmental Education Plan requires coordination and collaboration of individuals and organizations from local, state, and federal government agencies, and businesses including, but not limited to, schools, nonprofit and for-profit environmental education organizations, students and families, and community agencies.

SCHOOL~COMMUNITY PARTNERSHIPS SUPPORTING PLACE AND COMMUNITY~BASED EDUCATION

HIGH-QUALITY PLACE- AND COMMUNITY-BASED EDUCATION CONSISTS OF THE FOLLOWING ELEMENTS:

CURRICULUM CLEARLY GROUNDED IN LOCAL ISSUES AND POSSIBILITIES;

TEACHERS' WILLINGNESS TO STEP BEYOND THE LESSONS PRESENTED IN GENERIC TEXTS AND WORKBOOKS AND TO DESIGN INSTRUCTIONAL PLANS ON THEIR OWN OR WITH OTHERS;

STUDENTS BECOME KNOWLEDGE CREATORS AND EXERCISE THEIR OWN VOICES;

ADULT OPPORTUNITIES TO SHARE IN THE EDUCATION OF THEIR COMMUNITY'S CHILDREN;

LOCAL AGENCY PARTNERSHIPS WHICH PROVIDE YOUNG PEOPLE WITH ACCESS TO ADULTS OUTSIDE THE SCHOOL; AND

ACTIVITIES THAT COULD POTENTIALLY ENGENDER STUDENTS WITH A SENSE OF APPRECIATION OR POSITIVE REGARD ABOUT THEIR HOME COMMUNITIES AND REGIONS.

FROM: SMITH, G., & SOBEL, D. (2010). PLACE- AND COMMUNITY-BASED EDUCATION IN SCHOOLS. NEW YORK, NY: ROUTLEDGE

The Colorado Environmental Education Leadership Council will also:

- Propose revisions and updates to Colorado Environmental Education Plan;
- Create a communication plan for awareness and dissemination of the Colorado Environmental Education Plan that capitalizes on existing resources and partners;
- Identify and partner with local and regional leaders in outdoor education who provide resources;
- Develop a plan for continued funding for environmental education;
- Identify and support initiatives that sustain environmental education programs in Colorado;
- Monitor annual progress toward meeting the goals of the plan;
- Refine and adjust the plan over time as needed to meet the needs of students;
- Work with Department of Natural Resources to identify connections between Colorado Environmental Education Plan and the Colorado Kids Outdoor Grant Program.



Proposed Timeline

Task	Responsibility of	Timeline
Request for Proposal Process to convene, manage and staff the Colorado Environmental Education Leadership Council	Colorado Department of Education	Spring 2013
Begin recruitment for the Colorado Environmental Education Leadership Council	TBD	Spring 2013
Convene the first meeting of the Colorado Environmental Education Leadership Council	TBD	Summer 2013
Establish and convene the regional councils	Colorado Environmental Education Leadership Council	Fall 2013
Develop prioritized timeline for monitoring and evaluating the plan	Colorado Environmental Education Leadership Council & regional councils	Fall 2013
Create an annual work plan that capitalizes on existing partners and resources	Education Leadership Council & the regional councils	Annually
Monitor annual progress toward meeting the goals of the plan	Colorado Environmental Education Leadership Council	Every July for previous fiscal year
Refine and adjust the plan over time as needed to meet the needs of students	Colorado Department of Education, Department of Natural Resources, Colorado Environmental Education Leadership Council	Every 5 years

Strategies for Collaboration



Supporting students on their journey to becoming environmentally literate and staying healthy through experiencing the outdoors and developing critical thinking and informed decision-making skills with regard to the environment requires a collaborative effort. The following strategies are designed to effectively guide interested parties in putting the Colorado Environmental Education Plan into practice.

1. Prepare students to understand, analyze and address the major environmental challenges facing Colorado, the United States and the world:

- a. Promote and strengthen existing environmental education networks;
- b. Design and implement on-line resources to connect providers with districts and schools; and
- c. Provide teachers and students access to research-based data, content and resources.

Strategies	Responsible Party
<ul style="list-style-type: none"> • Create networking opportunities that connect districts with program providers and curriculum resources. 	Colorado Environmental Education Leadership Council & regional councils
<ul style="list-style-type: none"> • Develop tools for designing connected environmental education curriculum based on the identified relevant grade level expectations from the Colorado Academic Standards in social studies, science, comprehensive health and physical education, and reading, writing and communicating (See Appendix A). Note: Curriculum should also be designed to reinforce standards in mathematics, the arts, and English language proficiency where appropriate. 	Environmental education providers, school districts
<ul style="list-style-type: none"> • Identify and disseminate exemplary environmental education curricula and instructional resources. 	Environmental education providers, school districts
<ul style="list-style-type: none"> • Encourage connected learning opportunities and partnerships among nonprofit, business, governmental, and school based environmental educational providers. 	Regional councils, environmental education providers & community organizations
<ul style="list-style-type: none"> • Encourage joint planning sessions to identify connections across disciplines to reinforce environmental education concepts and skills. 	Regional councils, teachers, environmental education providers, school districts
<ul style="list-style-type: none"> • Evaluate and disseminate existing on-line resources and tools that connect teachers and districts with environmental education resources, programs and tools. 	Colorado Environmental Education Leadership Council, Regional councils, environmental education providers

2. Connect teachers and students to standards-based, relevant, environmental education experiences in an effort to develop lifelong health, wellness and civic minded behaviors:

- a. Coordinate existing tools and resources with districts, schools and teachers for implementation of quality field experiences as part of the curriculum; and
- b. Increase awareness of and access to place-based education opportunities for teachers and students.

Strategies	Responsible Party
<ul style="list-style-type: none"> • Add to existing comprehensive community maps showing access to programming and resources for environmental education. (http://www.coloradoee.org) 	Environmental education providers & community organizations
<ul style="list-style-type: none"> • Share existing resources for creating outdoor classrooms and schoolyard wildlife habitat. 	Environmental education providers & community organizations
<ul style="list-style-type: none"> • Develop exemplars and resources to showcase how schools and districts can use the classroom, school building, school grounds, and surrounding community as engaging educational environments. 	Regional councils, environmental education providers & community organizations
<ul style="list-style-type: none"> • Provide, or integrate into existing professional development opportunities, experiential outdoor education for teachers to increase their comfort level in utilizing the outdoors as an educational environment. 	Regional councils, environmental education providers & community organizations
<ul style="list-style-type: none"> • Develop tools for administrators to evaluate and adapt their risk management policies and other relevant policies associated with utilizing school building grounds and off-site locations. 	Regional councils, environmental education providers
<ul style="list-style-type: none"> • Encourage partnerships among nonprofit, business, governmental, and school-based environmental educational providers to encourage outdoor experiences. 	Regional councils, environmental education providers & community organizations
<ul style="list-style-type: none"> • Provide professional development opportunities for administrators to increase awareness and comfort level in utilizing the outdoors as an educational environment. 	Regional councils, environmental education providers & community organizations
<ul style="list-style-type: none"> • Promote service-learning opportunities that include environmental education and community health. 	Environmental education providers & community organizations
<ul style="list-style-type: none"> • Encourage the development of after school clubs focused on exploring the environment and the utilization of the outdoors to help students develop habits for lifelong health and wellness. 	Regional councils, teachers, environmental education providers, school districts
<ul style="list-style-type: none"> • Work with the Colorado Department of Public Health and Environment (CDPHE) to implement the U.S. Department of Education’s Green Ribbon Schools program. 	Colorado Environmental Education Leadership Council, Colorado Department of Education
<ul style="list-style-type: none"> • Increase awareness of environmental education opportunities that engage the whole family. 	Regional councils, teachers, environmental education providers, school districts

3. Connect school districts and teachers to professional development opportunities in environmental education:

- a. Increase teachers’ content knowledge; and
- b. Improve teachers’ pedagogical content knowledge and skills, including the use of:
 - i. Interdisciplinary, place-based and research-based instructional strategies;
 - ii. Innovative technologies as an integral element of environmental education; and
 - iii. Best practices that underpin environmental education principles.

Strategies	Responsible Party
<ul style="list-style-type: none"> • Increase awareness of existing professional development opportunities and resources such as professional teacher organizations, conferences and district in-services, etc. 	Colorado Environmental Education Leadership Council, regional councils, environmental education providers
<ul style="list-style-type: none"> • Inventory existing professional development programs and resources in the state, and identify gaps including: <ul style="list-style-type: none"> - Opportunities to help curriculum coordinators and teachers integrate environmental education into the curriculum; - Opportunities to increase knowledge and skills in environmental processes and human systems; - Opportunities to help teachers engage students in proactive decision-making and issue investigation in the community and school; - Opportunities for students to participate in quality outdoor experiences that foster connection and appreciation for the environment and physical activity. 	Colorado Environmental Education Leadership Council, regional councils, environmental education providers & community organizations
<ul style="list-style-type: none"> • Engage teachers in professional development opportunities which increase content knowledge and instructional strategies around use of technologies that support environmental education. 	School districts, environmental education providers
<ul style="list-style-type: none"> • Identify and develop formative assessments and accountability measures that can be used to measure student learning in environmental education. 	School districts, environmental education providers
<ul style="list-style-type: none"> • Work with Colorado Department of Education Content Specialists to develop and implement trainings on how to read and use the Colorado Academic Standards for environmental educators, teachers and community organizations. 	Colorado Department of Education, regional councils, & environmental education providers
<ul style="list-style-type: none"> • Compile assessment exemplars for environmental education including formative and interim assessments. 	School districts, environmental education providers
<ul style="list-style-type: none"> • Create professional development opportunities focused on or aligned with the environmental education concepts of systems, interdependence, the importance of where one lives, integration/infusion, roots in the real world, and life long learning. 	Environmental education providers

Institutionalizing Environmental Education

These suggestions provide guidance to districts, schools, teachers, and community organizations for implementing and strengthening environmental education efforts that connect and contribute to the larger state plan. Highlights of high quality environmental education efforts in Colorado schools can be found in Appendix C.

Districts and Schools:

- 1. Support teachers in the development and implementation of environmental education curricula and field experiences:**
 - a. Become familiar with the Colorado Environmental Education Plan and determine possible connections to school or district planning efforts;
 - b. Identify local community and online resources;
 - c. Invite local environmental education experts to participate in planning for the inclusion of environmental education in the schools; and/or
 - d. Encourage schools to develop partnerships with the local environmental education community and business organizations to assist education efforts.
- 2. Facilitate the use of the outdoors as an educational environment:**
 - a. Examine district and school policies to determine potential barriers to utilizing the school building, school grounds or community as a learning tool for teaching environmental education; and/or
 - b. Encourage schools to work with the Colorado Department of Transportation's Safe Routes to School program to develop safe and feasible ways to transport students from school to local green spaces (parks, gardens, business parks) or community resources for outdoor learning.

Teachers:

- 1. Incorporate environmental education into standards-based curriculum:**
 - a. Look for opportunities to integrate environmental education across disciplines;
 - b. Enlist families, other teachers and community partners to promote and plan outdoor learning experiences for students;
 - c. Participate in high-quality, standards-based professional development opportunities to increase content and pedagogical knowledge and skills (See Appendix D);
 - d. Encourage collaborative efforts among staff, families, and community members;
 - e. Engage in professional learning communities to explore opportunities to for utilizing the greater community as an environmental education resource; and/or
 - f. Observe or shadow teachers who are already integrating environmental education into their classrooms.
- 2. Utilize the outdoors as an educational environment:**
 - a. Use the school grounds and/or community open space as part of a quality learning experience;
 - b. Seek out high-quality field-based opportunities; and/or
 - c. Encourage students to participate in projects or service learning opportunities that enhance environmental education.

Environmental Education Providers:

1. **Participate in the coordination of partnerships, development of resources and implementation of professional development.**
 - a. Become familiar with each section of the Colorado Environmental Education Plan and determine which areas would support teacher needs;
 - b. Contact the regional councils to find high quality professional development or professional learning communities to increase knowledge and skills in environmental education; and/or
 - c. Post resources and professional development opportunities on-line at www.coloradoee.org
2. **Implement high quality, standards-based environmental education (See Appendices D, E);**
 - a. Become familiar with the design and philosophy of the Colorado Academic Standards in order to effectively contribute to educational opportunities;
<http://www.cde.state.co.us/standardsandinstruction/coloradostandards>;
 - b. Design programs and resources to align with the Colorado Academic Standards; and/or
 - c. Use district or school curriculum and resources to provide students with opportunities for addressing, analyzing and making decisions about environmental issues on a local and global level.
3. **Use assessment data from environmental education programs to monitor the success of this plan. The data collected should include:**
 - a. Numbers and grade levels of students reached;
 - b. Professional development opportunities offered and numbers of teachers trained;
 - c. Hours of contact time;
 - d. Content provided, including Colorado Academic Standards addressed; and
 - e. Evaluation results from program participants. This data may include information about program satisfaction, meeting curriculum needs and perceived program effectiveness.

23

Community Organizations, Government Agencies and Businesses:

1. **Participate in the coordination of partnerships, development of resources, and implementation of professional development:**
 - a. Reach out to members of the school community to increase awareness of available resources, field experts, and possible training opportunities;
 - b. Work with the regional councils to create a regional blueprint for implementing and supporting environmental education; and/or
 - c. Provide assistance to schools in developing and coordinating a plan to ensure students have environmental education experiences every year.
2. **Encourage the use of outdoor locations as an educational environment for the local schools:**
 - a. Work with districts, schools and teachers to assist in managing and guiding the outdoor work of students;
 - b. Model effective practices in environmental education; and/or
 - c. Support the use of the school grounds for outdoor learning experiences.
3. **Support teachers in implementing high quality, standards-based environmental education in the classroom:**
 - a. Become familiar with the design and philosophy of the Colorado Academic Standards in order to effectively contribute to educational opportunities
<http://www.cde.state.co.us/standardsandinstruction/coloradostandards>;
 - b. Work with teachers to integrate environmental education experiences into the curriculum that extend learning experiences; and/or
 - c. Ensure all available programming for pre-K-12 students in Colorado is standards-based and aligns with the Colorado Academic Standards.

Colorado Department of Natural Resources Supports Educators

The Colorado Department of Natural Resources (DNR) has been a long-time partner with the Colorado Department of Education (CDE) in order to support natural resources education in Colorado public schools. For more than 50 years the Colorado Parks and Wildlife (CPW) Division of DNR has been creating curriculum resources, providing high-quality professional development training for environmental educators and classroom teachers by providing classroom materials to ensure that Colorado students know about and can make informed decisions about the place that they live and the wildlife that shares our state. Detailed examples of several of the programs listed below can be found throughout this Colorado Environmental Education Plan.

Professional Development for Teachers

From conference sessions to week-long summer institutes, CPW provides high-quality professional development opportunities on wildlife biology, ecosystems, the North American Model of Wildlife Management, outdoor recreation skills and a host of other topics. Training opportunities include: Project WILD workshops for K-12 educators; Growing Up WILD for early childhood educators; Flying WILD for middle school educators; special-topic wildlife ecology or field investigations workshops for secondary educators; Teaching Environmental Science Naturally(TEN) summer institutes in communities around the state; and National Archery in the Schools Program's Basic Archery Instructor training as well as National Fishing in the Schools Program certification for Physical Education teachers.

Supplemental Curriculum and Resources for the Classroom

CPW Education resources are designed to augment and support the academic standards that educators are already responsible for teaching in their classroom. The resources offered address a broad spectrum of educator needs. Some examples include: supplemental curriculum modules that give high school biology teachers the information needed to teach genetics through local wildlife examples; check-out hands-on education materials (wildlife artifacts, field investigation kits, GPS units, water testing kits, fishing poles, etc.); the Colorado ecosystem poster series for the classroom; and interactive web-based games and other on-line resources. All of these teacher-tested resources are available free to Colorado educators.

Grants and Continuing Support for Educators

Keeping the lines of communication open with Colorado educators allows CPW to continually adjust programs based on current educator needs. This on-going relationship with educators has led to the agency offering grants to schools that want to pursue participation in CPW-sponsored programs. Currently the WILD Outdoor Classroom Grant Program and the Colorado Archery in the Schools Program Equipment Grant Program disburse thousands of dollars in support directly to Colorado schools.



Conclusion

This environmental education plan seeks to ensure that all of Colorado's students receive high quality, standards-based environmental education and will lead to students who are postsecondary and workforce ready for the jobs, challenges, and opportunities of the 21st century.

Environmental education provides students with essential knowledge and skills necessary to be active and productive citizens in a global community. Many of the challenges and opportunities society currently faces focus on the environment. To overcome these challenges and take



advantage of emerging opportunities, students need to have the knowledge and skills to understand complex problems, weigh different options, and look for solutions. In high-quality environmental education, students integrate and apply knowledge and skills to real-life problems and issues facing society in order to form well informed opinions and take action.

Students who spend more time being physically active and learning outdoors receive benefits that go beyond academics. Outdoor education fosters students' development of

healthy habits and connection to the place in which they live. Outdoor learning experiences increase student engagement and enthusiasm for learning while promoting an active and healthy lifestyle. Supporting students in developing a sense of place by experiencing Colorado's varied environments connects them to the land and allows them to take ownership of a shared natural heritage.

Ultimately, through environmental education:

- Students will understand how their actions and decisions affect the environment so they can act on that understanding in a responsible and effective manner;
- Students will have an understanding of human dependency on a healthy environment;
- Students will participate in standards-based, relevant, outdoor learning experiences in environmental education that lead to postsecondary workforce readiness;
- Teachers will effectively and creatively utilize best practices and approaches to teaching about the environment;
- Schools and districts will access a network of educators, volunteers and community partners to increase environmental education opportunities for pre-K–12 students.



Colorado Environmental Education Plan



Appendices

Appendix A: The Colorado Kids Outdoors Grant Legislation

Environmental education builds upon students' abilities to define, explore, evaluate, discuss respectfully, disagree about, and act on environmental issues locally, nationally, and globally. Students also learn about the complexity of environmental issues and their role as a citizen in making decisions. Every solution to environmental problems involves benefits and consequences; students need to be able to weigh the benefits versus the consequences of proposed solutions in their investigation of environmental issues. A study of the environment requires an interdisciplinary approach that breaks down traditional boundaries between disciplines. For example, when a student studies a problem in the environment, the scientific underpinnings of that problem, along with an understanding of its historical and geographic context, provides the student with a more holistic understanding of the issue. Developing students' knowledge and understanding of the environment requires support for students learning about and in outdoor environments.

In May 2010, Colorado Governor Bill Ritter signed HB 10-1131 into law which recognized the importance of the outdoor environment on the health of the state's residents, specifically Colorado youth. The new law established the Colorado Kids Outdoors Grant Program, and required the Colorado Department of Education to adopt a statewide plan for environmental education. The goals of both the grant program and the statewide plan are twofold: (1) to improve young people's knowledge of the environment, and (2) to increase young people's opportunities for outdoor educational experiences. In partnership with the Colorado Department of Natural Resources and with the help of interested citizens across the state, CDE developed the Colorado Environmental Education Plan to build and sustain the partnerships and awareness needed to promote, coordinate, implement, and maintain standards-based environmental education across the state. The development of the CEEP sets the stage for the vision articulated in HB 10-1131 for coordination and cooperation between schools and community partners. The CEEP is designed to articulate strategies where all potential partners can identify their role in making the vision of HB 10-1131 a reality across Colorado.

27

Professional Development Support

Forests to Faucets is a professional development opportunity for Aurora K–12th-grade educators sponsored by the Aurora Water Office of Water Conservation. The 3-day workshop offered each summer is designed to provide teachers with an in-depth education about water and water-related issues by taking them literally from the forest to the faucet. During the workshop, teachers visit forest fire burn areas in the upper South Platte watershed, the Aurora Reservoir, the Aurora xeriscape garden and several water treatment plants. They explore water-related topics such as where our water comes from, how our water is treated, the importance of a healthy forest and water conservation. Teachers examine Colorado water issues and develop techniques to help learners make informed decisions about the water they use all while earning graduate level recertification credit and receiving resources like the Project Learning Tree and Project WET (Water Education for Teachers) curriculum guides for use in their classrooms. Project Learning Tree is a program of the Colorado State Forest Service.

Project Learning Tree (PLT) sponsors the national GreenSchools! Initiative. This program provides training and funding for students and teachers to investigate environmental issues at their school and engage with their community in service-learning projects that create green and healthy learning environments. The program builds upon the many PLT schools around the country and in Colorado that incorporate PLT into their academic curriculum across multiple grade levels and classes.



Appendix B: Environmental Education in the Colorado Academic Standards

This section provides users of this plan with an overview of the Colorado Academic Standards that apply to environmental education. The following charts serve as the framework for developing standards-based environmental education curricula. The first chart outlines the Prepared Graduate Competencies (the end in mind for postsecondary workforce readiness) in social studies, science, and comprehensive health and physical education, and reading, writing and communicating that directly connect to the goals of environmental education. The second chart breaks this down further into Grade Level Expectations which serve as a developmental progression for learning environmental education based on the Colorado Academic Standards. For comprehensive health and physical education, only a select few of the Grade Level Expectations are provided in the interest of space.

Colorado Prepared Graduate Competencies that Support Environmental Education

Content Area	Standard	Prepared Graduate Competency
Social Studies	History	Analyze key historical periods and patterns of change over time within and across nations and cultures
	Geography	Develop spatial understanding, perspectives, and personal connections to the world
		Examine places and regions and the connections among them
	Economics	Understand the allocation of scarce resources in societies through analysis of individual choice, market interaction, and public policy
Civics	Analyze and practice rights, roles, and responsibilities of citizens	
Reading, Writing, and Communicating	Research and Reasoning	Articulate the position of self and others using experiential and material logic
		Gather information from a variety of sources; analyze and evaluate the quality and relevance of the source; and use it to answer complex questions
		Demonstrate the use of a range of strategies, research techniques, and persistence when engaging with difficult texts or examining complex problems or issues

Colorado Prepared Graduate Competencies that Support Environmental Education

Content Area	Standard	Prepared Graduate Competency
Science	Physical Science	Apply an understanding that energy exists in various forms, and its transformation and conservation occur in processes that are predictable and measurable
	Life Science	Analyze the relationship between structure and function in living systems at a variety of organizational levels, and recognize living systems dependence on natural selection
		Explain and illustrate with examples how living systems interact with the biotic and abiotic environment
	Earth Science	Evaluate evidence that Earth's geosphere, atmosphere, hydrosphere, and biosphere interact as a complex system
		Describe how humans are dependent on the diversity of resources provided by Earth and Sun
	Comprehensive Health and Physical Education	Movement Competence and Understanding
Demonstrate understanding of movement concepts, principles, strategies, and tactics as they apply to learning and performing physical activities		
Physical and Personal Wellness		Participate regularly in physical activity
		Achieve and maintain a health-enhancing level of physical fitness
		Apply knowledge and skills to engage in lifelong healthy eating
		Apply knowledge and skills related to health promotion, disease prevention, and health maintenance
Emotional and Social Wellness		Utilize knowledge and skills to enhance mental, emotional, and social well-being
		Exhibit responsible personal and social behavior that respects self and others in physical activity settings
Prevention and Risk Management		Apply personal safety knowledge and skills to prevent and treat intentional or unintentional injury

Colorado Grade Level Expectations That Support Environmental Education

30

Grade	CAS	CAS Ref Number	Grade Level Expectation
High School	Geography	SS09-GR.HS-S.2-GLE.1	Use different types of maps and geographic tools to analyze features on Earth to investigate and solve geographic questions
		SS09-GR.HS-S.2-GLE.2	Explain and interpret geographic variables that influence the interaction of people, places, and environments
		SS09-GR.HS-S.2-GLE.3	The interconnected nature of the world, its people and places.
	Economics	SS09-GR.HS-S.3-GLE.1	Productive resources-natural, human, capital-are scarce; therefore, choices are made about how individuals, businesses, governments, and societies allocate these resources
	Civics	SS09-GR.HS-S.4-GLE.1	Research, formulate positions, and engage in appropriate civic participation to address local, state, and national issues or policies
	Physical Science	SC09-GR.HS-S.1-GLE.5	Energy exists in many forms such as mechanical, chemical, electrical, radiant, thermal, and nuclear, that can be quantified and experimentally determined
	Life Science	SC09-GR.HS-S.2-GLE.1	Matter tends to be cycled within an ecosystem, while energy is transformed and eventually exits an ecosystem
		SC09-GR.HS-S.2-GLE.2	The size and persistence of populations depend on their interactions with each other and on the abiotic factors in an ecosystem
		SC09-GR.HS-S.2-GLE.9	Evolution occurs as the heritable characteristics of populations change across generations and can lead populations to become better adapted to their environment
	Earth Systems Science	SC09-GR.HS-S.3-GLE.4	Climate is the result of energy transfer among interactions of the atmosphere, hydrosphere, geosphere, and biosphere
		SC09-GR.HS-S.3-GLE.5	There are costs, benefits, and consequences of exploration, development, and consumption of renewable and nonrenewable resources
		SC09-GR.HS-S.3-GLE.6	The interaction of Earth's surface with water, air, gravity, and biological activity causes physical and chemical changes



Colorado Grade Level Expectations That Support Environmental Education

Grade	CAS	CAS Ref Number	Grade Level Expectation
High School	Earth Systems Science	SC09-GR.HS-S.3-GLE.7	Natural hazards have local, national and global impacts such as volcanoes, earthquakes, tsunamis, hurricanes, and thunderstorms
	Movement Competence and Understanding	PE09-GR.HS-S.1-GLE.1	Participate at a competent level in a variety of lifelong physical activities
	Movement Competence and Understanding	PE09-GR.HS-S.1-GLE.2	Understand the cognitive impact of movement
	Physical and Personal Wellness	PE09-GR.HS-S.2-GLE.2	Identify community resources to maintain lifelong physical activity
		PE09-GR.HS-S.2-GLE.3	Participate regularly in health-enhancing and personally rewarding physical activity outside of physical education
		CH09-GR.HS-S.2-GLE.2	Analyze how family, peers, media, culture, and technology influence healthy eating choices
		CH09-GR.HS-S.2-GLE.6	Develop and maintain the ongoing evaluation of factors that impact health, and modify lifestyle accordingly
	Emotional and Social Wellness	CH09-GR.HS-S.3-GLE.1	Analyze the interrelationship of physical, mental, emotional, and social health
		PE09-GR.HS-S.3-GLE.2	Demonstrate collaboration, cooperation, and leadership skills
	Prevention and Risk Management	PE09-GR.HS-S.4-GLE.2	Demonstrate knowledge of safety and emergency response procedures
		CH09-GR.HS-S.4-GLE.1	Advocate for changes in the home, school, or community that would increase safety
	Reading, Writing, and Communicating	RWC09-GR.HS-S.4-GLE.2	Logical arguments distinguish facts from opinions; and evidence defines reasoned judgment
		RWC09-GR.HS.S.4-GLE.1	Informational materials, including electronic sources, need to be collected, evaluated, and analyzed for accuracy, relevance, and effectiveness for answering research questions



Colorado Grade Level Expectations That Support Environmental Education

Grade	CAS	CAS Ref Number	Grade Level Expectation
8th grade	Geography	SS09-GR.8-S.2-GLE.1	Use geographic tools to analyze patterns in human and physical systems
		SS09-GR.8-S.2-GLE.2	Conflict and cooperation occur over space and resources
	Physical Science	SC09-GR.8-S.1-GLE.2	There are different forms of energy, and those forms of energy can be changed from one form to another – but total energy is conserved
	Life Science	SC09-GR.8-S.2-GLE.1	Human activities can deliberately or inadvertently alter ecosystems and their resiliency
	Earth Systems Science	SC09-GR.8-S.3-GLE.1	Weather is a result of complex interactions of Earth’s atmosphere, land and water, that are driven by energy from the sun, and can be predicted and described through complex models
		SC09-GR.8-S.3-GLE.2	Earth has a variety of climates defined by average temperature, precipitation, humidity, air pressure, and wind that have changed over time in a particular location
	Physical and Personal Wellness	PE09-GR.8-S.2-GLE.1	Identify the personal, physiological, and fitness benefits of participating in a variety of physical activities
		PE09-GR.8-S.2-GLE.2	Identify preferences for lifetime physical activity
		PE09-GR.8-S.2-GLE.3	Determine one’s responsibility for developing skills, acquiring knowledge, and achieving fitness
		CH09-GR.8-S.2-GLE.4	Promote and enhance health through disease prevention
	Emotional and Social Wellness	CH09-GR.8-S.3-GLE.2	Internal and external factors influence mental and emotional health
	Reading, Writing, and Communicating	RWC09-GR.8-S.4-GLE.1	Individual research projects begin with information obtained from a variety of sources, and is organized, documented, and presented using logical procedures



Colorado Grade Level Expectations That Support Environmental Education

Grade	CAS	CAS Ref Number	Grade Level Expectation
8th grade	Reading, Writing, and Communicating	RWC09-GR.8-S.4-GLE.2	Common fallacies and errors occur in reasoning
		RWC09-GR.8-S.4-GLE.3	Quality reasoning relies on supporting evidence in media
7th Grade	Geography	SS09-GR.7-S.2-GLE.1	Use geographic tools to gather data and make geographic inferences and predictions
		SS09-GR.7-S.2-GLE.2	Regions have different issues and perspectives
	Life Science	SC09-GR.7-S.2-GLE.1	Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment
	Physical and Personal Wellness	CH09-GR.7-S.2-GLE.1	Analyze factors that influence healthy eating behaviors
		CH09-GR.7-S.2-GLE.2	Demonstrate the ability to make healthy food choices in a variety of settings
	Emotional and Social Wellness	PE09-GR.7-S.3-GLE.2	Demonstrate inclusiveness in and out of classroom settings
	Prevention and Risk Management	PE09-GR.7-S.4-GLE.1	Implement safety procedures in the utilization of space and equipment
		CH09-GR.7-S.4-GLE.2	Demonstrate safety procedures for a variety of situations
	Reading, Writing, and Communicating	RWC09-GR.7-S.4-GLE.1	Answering a research question logically begins with obtaining and analyzing information from a variety of sources



Colorado Grade Level Expectations That Support Environmental Education

34

Grade	CAS	CAS Ref Number	Grade Level Expectation
6th grade	Geography	SS09-GR.6-S.2- GLE.1	Use geographic tools to solve problems
		SS09-GR.6-S.2- GLE.2	Human and physical systems vary and interact
	Civics	SS09-GR.6-S.4- GLE.1	Analyze the interconnectedness of the United States and other nations
	Life Science Earth Systems	SC09-GR.6-S.2- GLE.1	Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species
		SC09-GR.6-S.2- GLE.2	Organisms interact with each other and their environment in various ways that create a flow of energy and cycling of matter in an ecosystem
		SC09-GR.6-S.3- GLE.1	Complex interrelationships exist between Earth's structure and natural processes that over time are both constructive and destructive
		SC09-GR.6-S.3- GLE.2	Water on Earth is distributed and circulated through oceans, glaciers, rivers, ground water, and the atmosphere
		SC09-GR.6-S.3- GLE.3	Weather conditions change because of the uneven heating of Earth's surface by the Sun's energy. Weather changes are measured by differences in temperature, air pressure, wind and water in the atmosphere and type of precipitation
	Movement Competence and Understanding	PE09-GR.6-S.1- GLE.2	Participate in activities that require problem-solving, cooperation, skill assessment, and teambuilding
	Physical and Personal Wellness	CH09-GR.6-S.2- GLE.4	Analyze how positive health behaviors can benefit people throughout their life span
	Prevention and Risk Management	CH09-GR.6-S.4- GLE.4	Demonstrate ways to advocate for safety, and prevent unintentional injuries
	Reading, Writing, and Communicating	RWC09-GR.6- S.4-GLE.1	Individual and group research projects require obtaining information on a topic from a variety of sources and organizing it for presentation



Colorado Grade Level Expectations That Support Environmental Education

Grade	CAS	CAS Ref Number	Grade Level Expectation
5th grade	Geography	SS09-GR.5-S.2-GLE.1	Use various geographic tools and sources to answer questions about the geography of the United States
		SS09-GR.5-S.2-GLE.2	Causes and consequences of movement
	Life Science Earth Systems	SC09-GR.5-S.3-GLE.1	Earth and sun provide a diversity of renewable and nonrenewable resources
		SC09-GR.5-S.3-GLE.2	Earth's surface changes constantly through a variety of processes and forces
	Physical and Personal Wellness	PE09-GR.5-S.2-GLE.3	Connect the health-related fitness components to the body systems
		CH09-GR.5-S.2-GLE.5	Comprehend concepts, and identify strategies to prevent the transmission of disease
	Emotional and Social Wellness	PE09-GR.5-S.3-GLE.2	Choose to participate cooperatively and productively in group and individual physical activities
		PE09-GR.5-S.3-GLE.3	Identify personal activity interests and abilities
	Prevention and Risk Management	CH09-GR.5-S.4-GLE.3	Demonstrate basic first aid and safety procedures
	4th grade	Social Studies Geography	SS09-GR.4-S.2-GLE.1
SS09-GR.4-S.2-GLE.2			Connections within and across human and physical systems are developed
Physical Life Science		SC09-GR.4-S.1-GLE.1	Energy comes in many forms such as light, heat, sound, magnetic, chemical, and electrical
		SC09-GR.4-S.2-GLE.1	All living things share similar characteristics, but they also have differences that can be described and classified



Colorado Grade Level Expectations That Support Environmental Education

Grade	CAS	CAS Ref Number	Grade Level Expectation
4th grade	Life Science	SC09-GR.4-S.2-GLE.3	There is interaction and interdependence between and among living and nonliving components of systems
	Physical and Personal Wellness	PE09-GR.4-S.2-GLE.1	Explain how the health-related components of fitness affect performance when participating in physical activity
		PE09-GR.4-S.2-GLE.2	Recognize the relationship between healthy nutrition and exercise
		CH09-GR.4-S.2-GLE.3	Explain that the dimensions of wellness are interrelated and impact personal health
	Reading, Writing, and Communicating	RWC09-GR.4-S.4-GLE.1	Comprehending new information for research is a process undertaken with discipline both alone and within groups
3rd grade	Geography	SS09-GR.3-S.2-GLE.1	Use various types of geographic tools to develop spatial thinking
		SS09-GR.3-S.2-GLE.2	The concept of regions is developed through an understanding of similarities and differences in places
	Earth Systems Science	SC09-GR.3-S.3-GLE.1	Earth's materials can be broken down and/or combined into different materials such as rocks, minerals, rock cycle, formation of soil, and sand – some of which are usable resources for human activity
	Physical and Personal Wellness	PE09-GR.3-S.2-GLE.1	Identify the benefits of sustained physical activity that causes increased heart rate and heavy breathing
		PE09-GR.3-S.2-GLE.2	Understand that the body is composed of water, muscle, bones, organs, fat, and other tissues
		CH09-GR.3-S.3-GLE.1	Utilize knowledge and skills to treat self and others with care and respect
	Reading, Writing, and Communicating	RWC09-GR.3-S.4-GLE.1	Researching a topic and sharing findings are often done with others



Colorado Grade Level Expectations That Support Environmental Education

Grade	CAS	CAS Ref Number	Grade Level Expectation
2nd Grade	Geography	SS09-GR.2-S.2-GLE.1	Use geographic terms and tools to describe space and place
		SS09-GR.2-S.2-GLE.2	People in communities manage, modify, and depend on their environment
	Economics	SS09-GR.2-S.3-GLE.1	The scarcity of resources affects the choices of individuals and communities
	Civics	SS09-GR.2-S.4-GLE.1	Responsible community members advocate for their ideas
	Life Science	SC09-GR.2-S.2-GLE.1	Organisms depend on their habitat's nonliving parts to satisfy their needs
	Earth Systems Science	SC09-GR.2-S.3-GLE.1	Weather and the changing seasons impact the environment and organisms such as humans, plants, and other animals
	Movement Competence and Understanding	PE09-GR.2-S.1-GLE.3	Use feedback to improve performance
	Physical and Personal Wellness	PE09-GR.2-S.2-GLE.1	Recognize the importance of making the choice to participate in a wide variety of activities that involve locomotion, nonlocomotion, and manipulation of objects outside of physical education class
		PE09-GR.2-S.2-GLE.2	Identify good brain health habits
		CH09-GR.2-S.2-GLE.2	Recognize basic childhood chronic diseases
	Emotional and Social Wellness	PE09-GR.2-S.3-GLE.1	Demonstrate positive and helpful behavior and words toward other students
	Prevention and Risk Management	CH09-GR.2-S.4-GLE.5	Demonstrate interpersonal communication skills to prevent injury or to ask for help in an emergency or unsafe situation



Colorado Grade Level Expectations That Support Environmental Education

Grade	CAS	CAS Ref Number	Grade Level Expectation
1st Grade	Geography	SS09-GR.1-S.2-GLE.1	Geographic tools such as maps and globes to represent places
		SS09-GR.1-S.2-GLE.2	People in different groups and communities interact with each other and the environment
	Life Science	SC09-GR.1-S.2-GLE.1	An organism is a living thing that has physical characteristics to help it survive
	Earth Systems Science	SC09-GR.1-S.3-GLE.1	Earth's materials can be compared and classified based on their properties
	Physical and Personal Wellness	CH09-GR.1-S.2-GLE.2	Demonstrate health enhancing behaviors to prevent unintentional injury or illness
	Emotional and Social Wellness	PE09-GR.1-S.3-GLE.1	Work independently and with others to complete work
	Reading, Writing, and Communicating	RWC09-GR.1-S.4-GLE.1	A variety of resources leads to locating information and answering questions of interest
Kindergarten	Geography	SS09-GR.K-S.2-GLE.1	People belong to different groups and live in different settings around the world that can be found on a map or globe
	Life Science	SS09-GR.K-S.1-GLE.2	Organisms can be described and sorted by their physical characteristics
	Earth Systems Science	SC09-GR.K-S.3-GLE.1	The sun provides heat and light to Earth
	Movement Competence and Understanding	PE09-GR.K-S.1-GLE.1	Demonstrate body and spatial awareness through movement
	Emotional and Social Wellness	CH09-GR.K-S.3-GLE.1	Exhibit understanding that one's actions impact others
	Physical and Personal Wellness	PE09-GR.K-S.3-GLE.1	Demonstrate respect for self, others, and equipment
	Reading, Writing, and Communicating	RWC09-GR.K-S.4-GLE.1	A variety of locations must be explored to find information that answers questions of interest

Colorado Grade Level Expectations That Support Environmental Education

Grade	CAS	CAS Ref Number	Grade Level Expectation
Preschool	Geography	SS09-GR.P-S.2-GLE.1	Develop spatial understanding, perspectives, and connections to the world
	Life Science	SS09-GR.P-S.1-GLE.2	Living things have characteristics and basic needs
	Earth Systems Science	SC09-GR.P-S.3-GLE.1	Earth's materials have properties and characteristics that affect how we use those materials
	Physical and Personal Wellness	PE09-GR.P-S.2-GLE.1	Recognize the positive feelings experienced during and after physical activity
	Prevention and Risk Management	CH09-GR.P-S.4-GLE.1	Identify ways to be safe while at play
	Reading, Writing, and Communicating	RWC09-GR.P-S.4-GLE.2	Problems can be identified and possible solutions can be created



Appendix C: Environmental Education in Action

The following vignettes are among the hundreds of programs and opportunities that demonstrate high quality environmental education.

Investigating Community Issues • Earth Force, Denver

Earth Force, Denver is a non-profit committed to building lasting, collaborative relationships that engage youth from school classrooms, afterschool programs and summer programs in environmental problem solving in their communities. Earth Force, Denver engages middle and high school students in community service-learning programs and trains classroom teachers on mentoring the process.

Participants brainstorm environmental issues in their community. After investigating possible solutions, one project is chosen. Earth Force, Denver facilitates the planning of the solution and helps participants contact necessary community resource people—it is up to the group to make final decisions and take actions. Throughout the process, students gain knowledge about the environment and interact with members of the community such as local businesses, government agencies, politicians and environmental specialists.

Youth can have an impact not just in the future, but right now, as environmental stewards and community leaders. Through Earth Force, Denver, young people get to direct their own learning experience as they apply important classroom lessons in the real life “laboratory” of their own neighborhood. The experience sticks with them for years!

Accomplishments include:

- Installing drinking water filters in older homes with lead pipes
- Planting trees along the S. Platte River to increase habitat and prevent bank erosion
- Creating schoolyard wildlife habitats
- Stenciling storm drains with the education warning “Dump No Waste, Drains to River”
- Improving neighborhood parks and pools
- Organizing bike repair and safety clinics
- Planting terrariums and flowering plant gifts for seniors in a nursing home

<http://www.earthforce.org/>

Environmental Leadership Program

The Environmental Leadership Program is a voluntary program through the **Colorado Department of Public Health and Environment (CDPHE)** that encourages and rewards superior environmental performers that go beyond the requirements of environmental regulations and move toward the goal of sustainability. The program is open to all Colorado businesses, industries, offices, educational institutions, municipalities, government agencies, community nonprofits and other organizations.

Schools who participate in the program will be recognized by the state for their commitment to sustainability and benefit from access to a network of Gold, Silver and Bronze participants in the program from industry, government and community organizations. This network is available to provide potential resources to schools as well as help students make connections between future career opportunities and environmental literacy.

CDPHE will support schools and organizations through:

- Identifying criteria for schools
- Annually recognizing schools
- Providing mentoring and other resources
- Engaging schools in the Environmental Leadership Program Network

<https://www.colorado.gov/pacific/cdphe/environmental-leadership-program>

Using Agriculture to Build Environmental Literacy • Bear Creek High School

Senior Field Studies is a one-semester course taught each spring at Bear Creek High School in Lakewood. This unique course uses an interdisciplinary approach in the classroom combined with an experiential learning experience. Each high school senior gets to live with a Colorado farm or ranch family for one week experiencing and learning about agriculture first hand.

Course activities include visiting the National Western Stock Show, a one-day field trip to the Petrocco Farms in Brighton, Colorado, classroom discussions focusing on the history of farming in the world, the United States and Colorado, viewing and discussing various agriculture videos, making daily journal entries about their experiences and completing pre and post tests and evaluations. As agricultural and environmental topics such as water, governmental regulations, wildlife issues, economics of farming and labor and farm worker issues are covered, they address the academic areas of history, geography, civics and economics. Experience demonstrates that the farm stay is a powerful learning experience for suburban students. Many students return to visit their farm families for years to come and they encourage other students to take the course.

<https://www.facebook.com/SeniorFieldStudies>

Extending the Learning Experience • Rocky Mountain Bird Observatory

Each year thousands of students have the opportunity to collect real data on migrating birds at The Rocky Mountain Bird Observatory's bird banding stations throughout Colorado. Students observe biologists and educators as they band birds to learn about migration routes and timing, evaluate body condition, study population demographics and advance our knowledge of bird longevity records for individual species.

Through interactions with natural resources professionals, students collect and analyze data and watch the banding process first-hand. Back in the classroom, visits by educators allow students to graph data collected at banding stations and map the migration routes of birds they saw. Through this "Young Biologist" program, students further develop their understanding of migration and learn that birds are a shared resource that serve as indicators of environmental health throughout our hemisphere. Educators extend the learning experience and help create lasting connections by providing classroom visits in addition to the field trip.

<http://www.rmbo.org>

Developing Skills for Life • Environmental Learning for Kids (ELK)

Environmental Learning for Kids was established to meet a growing need to introduce and educate Colorado's urban youth about science, leadership, and careers. The need arose from the realization that all young people need strong educational support, good role models, and opportunities for positive community action in order to become engaged, productive, and successful members of society.

Youth in Natural Resources (YNR), ELK's core program for youth ages 14-25, is a multi-year learning experience structured to provide well-rounded education in both science and leadership. The program is for youth who are ready to explore career options and gain work experience in the

natural resource and science fields. By immersing students in science education and leadership development through hands-on field activities, local excursions, and overnight wilderness experiences, YNR is able to successfully ignite curiosity and inspire students in their academic studies and career searches. Allowing for an in-depth study of careers in science, conservation, and natural resource management through youth leadership and development activities ensures students are prepared to succeed in college and eventually the workforce. YNR builds a community of learners that becomes a strong support network to young people, similar to that of a family. YNR's long-term, year-round mentoring by scientists, and the community of learners it creates, makes it unique.

<http://www.elkkids.org/>

Impacting School Culture • Environmental Service Learning Projects

Ellis Elementary Schools' commitment to environmental literacy is school-wide, with an especially impressive focus on engaging the students as leaders in that effort.

- Each year, over 200 students complete environmental service learning projects.
- The Student Leadership Team instituted a school-wide recycling program, which is now in its third year and collects recyclables from each class on a weekly basis.
- The school installed eight solar panels powering three classrooms.
- Students planted native grasses and shrubs in the school's garden to reduce water use and runoff.

42 As a result of their efforts, Ellis Elementary applied to and was recognized by the Environmental Leadership Program at the Colorado Department of Public Health and Environment as a Gold Leader Member.

Environmental Education across Disciplines • School in the Woods

One November morning in 1996, two elementary teachers at Academy School District Twenty in Colorado Springs had an amazing idea. They knew that within their school district was a 640-acre section of ponderosa pine forest managed by the Colorado State Land Board. Suppose that land could be used as a living classroom for two classes of fourth graders with a special interest in nature? The entire curriculum would be based on the natural world—reading, writing, science and the arts would all be inspired by the students' experiences exploring the forest in all seasons. School in the Woods came into being in the fall of 1999, and it is still going strong. It is not a private or charter school, but a regular public school program. Fifty-two fourth graders spend their entire school year learning in, about and from the natural world. The school is a cooperative effort between a public school district (which operates the school), the Colorado State Land Board (which owns all but ten acres of the land) and the Colorado State Forest Service (which manages the trees on the land). School in the Woods students consistently perform well above average on state and school district academic assessments. The students return to their neighborhood schools for fifth grade with deep appreciation for the natural world and our place within it.

<http://www.asd20.org/sitw>

Quality Professional Development • Teaching Environmental Science Naturally

Colorado Parks and Wildlife coordinates and sponsors the Teaching Environmental Science Naturally (TEN) program in 13 communities across the state. TEN brings classroom teachers and natural resource agencies together in a collaborative effort to provide local, field-oriented environmental education. During the one to five day professional development workshops TEN gives teachers the tools, skills, and curriculum necessary to provide students a quality environmental education experience. TEN also promotes student understanding and appreciation of science and the natural environment by increasing local, field-oriented education opportunities.

TEN programs exemplify effective environmental education partnerships. Local natural resource agencies and classroom teachers work cooperatively to develop the TEN curricula and choose the outdoor locations. This local core committee of educators and natural resource agencies develop the site guide and outdoor activities for each outdoor location chosen. These activities, or curriculum, incorporate various aspects of nationally known environmental education programs including Project WILD.

For many teachers, the benefits of taking students to an outdoor site are clear; however, finding the time to incorporate environmental education into an already demanding curriculum is difficult. Teacher training is critical to making environmental education easier for teachers to teach and incorporate in their classroom. Participants visit the outdoor classroom sites and learn about the area's natural history and resource management. They also receive training in the TEN curriculum and ways to align with Colorado Academic Standards.

<http://cpw.state.co.us/learn/>

Quality Professional Development • School of Science and Inquiry

Castle Rock Elementary, the School of Science and Inquiry, is a traditional, public, neighborhood school with the goal of creating a school in which quality inquiry instruction is implemented in all instructional areas. Faculty has been immersed in four years of an embedded professional development model blending science and literacy using science notebooks as a tool for formative assessment and content integration. Because of this model, teachers are comfortable with the process of student led inquiry, not just in science, but across all content areas and are able to develop learning experiences for students that are relevant and meaningful.



Appendix D: Criteria for Quality Professional Development

These guidelines, taken from the Guidelines for Environmental Educators in Colorado (Colorado Alliance for Environmental Education, 2005), should be considered when creating professional development experiences for pre-K–12 teachers and community based educators. The complete set of guidelines is available at:

<http://www.caeec.org/sites/default/files/Guidelines2.pdf>

Environmental Literacy

Classroom teachers and environmental educators must be competent in the knowledge and skills associated with environmental literacy. Environmental educators should not only possess the competency to help their learners achieve these objectives but also embrace the spirit of environmental literacy by modeling it in their own endeavors. This includes fostering:

- Questioning, analysis and interpretation skills
- Knowledge of environmental processes and systems
- Processes for addressing environmental issues
- Personal civic responsibility
- Environmental sensitivity

Foundations of Environmental Education

Classroom teachers and environmental educators must have a basic understanding of the goals, theory, practice and history of the field of environmental education. This includes:

- Fundamental characteristics and goals of environmental education
- How environmental education is implemented
- The evolution of the field

Planning and Implementing Environmental Education

Educators combine high-quality education with the unique features of environmental education to design and implement effective instruction. Environmental educators enable learners to engage in inquiry and investigation, especially when considering environmental issues that are controversial and require learners to seriously reflect on their own and others' perspectives. Proper preparation should enable environmental educators to provide the interdisciplinary, hands-on, investigative learning opportunities that are central to environmental education. Environmental educators foster an environment such that student interactions are conducive to learning. This includes:

- Knowledge about learners and learning
- Knowledge of various teaching methods
- A climate for learning about and exploring the environment
- An inclusive and collaborative learning environment
- Settings for instruction
- Planning for instruction
- Flexible and responsible instruction
- Knowledge of environmental education materials and resources
- Technologies that assist learning
- Curriculum planning

Assessment and Evaluation

Environmental educators possess the knowledge, abilities and commitment to make assessment and evaluation integral to instruction and programs. Proper preparation should give environmental educators tools for assessing learner progress and evaluating the effectiveness of their instruction. This includes:

- Defining Assessment and Evaluation
- Learner Outcomes
- Assessment that is Part of Instruction
- Improving Instruction
- Evaluating Programs

Appendix E: Ensuring Quality in Environmental Education Materials

The National Project for Excellence is a collection of resources to help teachers, administrators and environmental education providers evaluate the quality of materials and resources, or design professional development opportunities. Guidelines exist for environmental education materials, community-based environmental education programming, and early childhood environmental education for the professional development of environmental educators.

The following guidelines, taken from the Environmental Education Materials: Guidelines for Excellence by the North American Association for Environmental Education should be used when selecting or creating materials or programs for use by pre-K–12 schools to ensure the highest quality. The complete set of guidelines is available at:

<http://eelinked.naaee.net/n/guidelines/topics/EE-Materials-Guidelines-for-Excellence>

- **Fairness and Accuracy.** Materials should be fair and accurate in describing environmental problems, issues and conditions, and in reflecting the diversity of perspectives on them;
- **Depth.** Materials should foster awareness of the natural and built environment, an understanding of environmental concepts, conditions and issues, and an awareness of the feelings, values, attitudes and perceptions at the heart of environmental issues, as appropriate for different developmental levels;
- **Emphasis on Skills Building.** Materials should build lifelong skills that enable learners to address environmental issues;
- **Action Orientation.** Materials should promote civic responsibility, encouraging learners to use their knowledge, personal skills, and assessments of environmental problems and issues as a basis for environmental problem-solving and action;
- **Instructional Soundness.** Materials should rely on instructional techniques that create an effective learning environment;
- **Usability.** Materials should be well designed and easy to use.⁹

