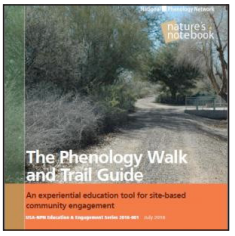
E.E. Resource Guide

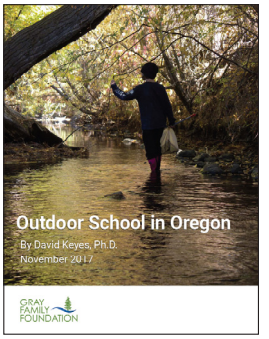
A selection of environmental education materials, resources and opportunities that you should know about



Phenology Walk and Trail Guide

The Phenology Walk and Trail Guide, developed by the USA National Phenology Network provides you with a step-by-step guide to creating a long-term Nature's Notebook Citizen and Professional Science Project, and resources for engaging your community in observing the seasonal and long term changes in plant and animal life cycle events. This resource include instructions on how to set up a monitoring location and how to partner with other organizations in your community working on similar programs. It also include program planning resources and evaluation recommendations. As a supplement, the USA National Phenology Network offers a 10-week, 50 hour, online Local Phenology Leader Certification Program.

USA National Phenology Network: naturesnotebook.org



Outdoor School in Oregon:

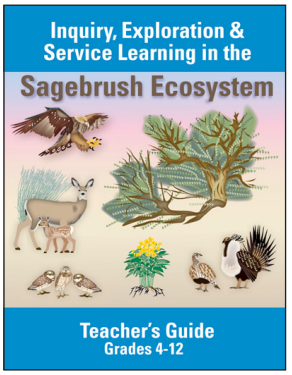
A Report by the Gray Family Foundation

As mentioned earlier in this publication, in 2016 Oregon voters passed Measure 99, which designates lottery funds to support outdoor school for every 5th and 6th grade student in the state.

This report, compiled by David Keyes, Ph.D., looks at the status of outdoor school in the state of Oregon, and provides a baseline assessment of outdoor school programs.

Through a survey of 1135 schools that servce fifth or sixth graders as well as 20 in-depth interviews with teachers, principals, and others, this report offers an overview of the past, present, and future of Outdoor School in Oregon.

Download the report from the Outdoor School for Everyone website at grayff.org/outdoor-school-for-everyone/

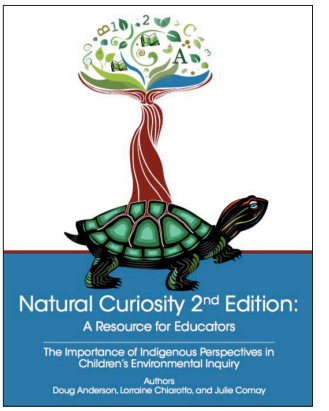


Sagebrush Ecosystem

An educational program has been developed by the U.S. Fish and Wildlife Service in collaboration with Engaging Every Student and other partners to help teachers inspire students to think critically about sagebrush ecosystems. Help us touch the hearts and minds of tens of thousands of young people over the next decade!

With resources including lesson plans aligned to standards for grades 4-12, Sagebrush Ecosystem trunks developed by Audubon Rockies, short videos, an educational poster, and expert partners available for classroom visits and/or field work, we seek to connect with the next generation of land stewards.

For additional sagebrush ecosystem education resources, please visit the Engaging Every Student blog at http://www.engagingeverystudent.com/blog/. You'll be able to find free sagebrush ecosystem lesson plans, posters, videos, books and more.



Natural Curiosity 2nd Edition:

A Resource for Educators: The Importance of Indigenous Perspective in Children's Environmental Inquiry

The second edition of Natural Curiosity supports a stronger basic awareness of Indigenous perspectives and their importance to environmental education. The driving motivation for a second edition was the burning need, in the wake of strong and unequivocal recommendations by the Truth and Reconciliation Commission, to situate Indigenous perspectives into the heart of Canadian educational settings and curricula, most notably in connection with environmental issues.

The Indigenous lens in this edition represents a cross-cultural encounter supporting what can become an ongoing dialogue and evolution of practice in environmental inquiry. Some important questions are raised that challenge us to think in very different ways about things as fundamental as the meaning of knowledge.

The print edition sells for $50. The online version (PDF) is $35.

http://naturalcuriosity.ca/aboutus.php?m=b

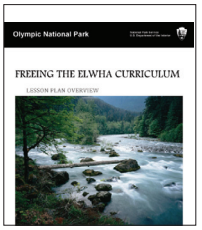
Grades K-8
Think Earth

This grade specific curriculum ranges from preschool to 8th grade and focuses on conservation of natural resources, waste reduction and minimizing pollution. This student based curriculum offers: comprehensive content, covering water, air, and land; field-tested and revised instruction and materials; quick and easy to teach; student assessments; and standards-based lessons. Think Earth provides award winning lessons that have been around since the 1990s and has been used by tens of thousands of teachers worldwide.

http://thinkearth.org

Grades 6-8

Freeing the Elwha Curriculum



The Freeing the Elwha Curriculum is an inquiry and standards based, integrated curriculum designed to guide middle school students in understanding the natural and manmade processes involved in river restoration. The removal of two dams from the Elwha River began September 2011, and is the biggest dam removal project in the world.

The curriculum's science component leads students from how weather affects water flow, through the habitat needs of salmon and the process of dam removal, to the state of the world's fisheries. The social studies component moves from the settlement of the Elwha and its surroundings, through issues involved in dam removal, ending with the importance of salmon to the Lower Elwha Klallam Tribe.

Math, language arts, and assessments fall naturally within the science and social studies units. A Creative Response section gives students a chance to express themselves artistically. The curriculum is flexible and educators can adapt the lessons depending on grade level requirements.

The Freeing the Elwha Curriculum is available online at http://www.nps.gov/olym/forteachers/classrooms/curriculummaterials.htm or you can request a full CD by contacting the Education Specialist at 360-565-3146.

Grades 3-4

Explore the Forest: Student Workbook (Grades 3-4)

The Oregon Forest Resources Institute (OFRI) created this 24-page, full-color publication especially for third- and fourth-grade students. It provides a grade-appropriate overview of Oregon forests, including forest ecology, tree biology, forest management and forest careers. It explores how we as a society need to balance the economic, ecological and social values of forests. Illustrations, puzzles and activities engage student interest.

Go to https://learnforests.org/resource_article/explore-the-forest

Grades 7-12

Climate Change Curriculum

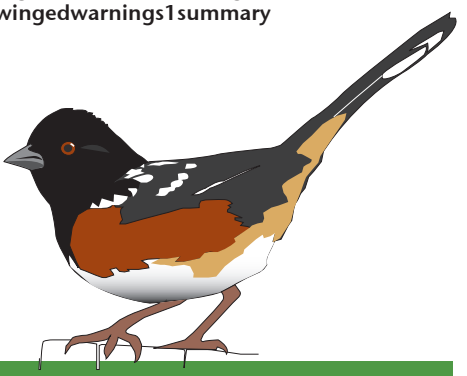
Stanford University offers this online Climate Change Curriculum for both middle and high school. This curriculum integrates concepts from the earth, life, and physical sciences as well as current data on climate systems to help students understand the phenomena of climate change, the justification for these phenomena, and why these phenomena are both scientifically and socially important.

https://pangea.stanford.edu/programs/outreach/climatechange/curriculum

Winged Warnings

A new series that explores our changing natural environment through birds—from eagles and ospreys to songbirds. Reporters traveled all around the world to study birds in their habitats to discover how they are being harmed by climate change, among other threats.

http://www.environmentalhealthnews.org/ehs/news/2014/aug/wingedwarnings1summary

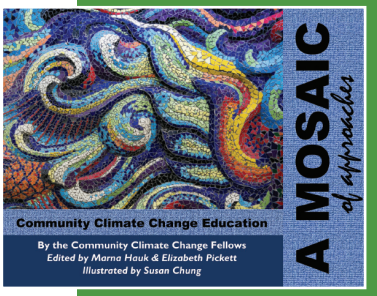


Grades 6-8 and 9-12

EarthEcho International's Educator Resource

EarthEcho International's Educator Resources include free videos, lesson plans, and other materials intended to support classroom learning for grades 6-8 and 9-12. Their tools assist educators in teaching students to explore and protect local natural resources. Many of the resources offered by EarthEcho are designed to satisfy Common Core and Next Generation Science Standards.

http://earthecho.org/educator-resources



Community Climate Change Education: A Mosaic of Approaches

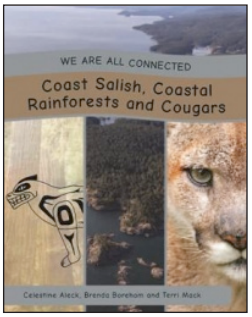
A downloadable eBook for practitioners and innovators featuring twenty-six stories from the field, shared by the EECapacity and NAAEE Community Climate Change Fellows.

Edited by Marna Hauk (Prescott University)

Features information and resources on over a dozen approaches to community climate change education, from public art, resilience gardening, and climate justice, to social innovation, marine science, and youth programming. Includes 50+ vignettes about the process of building successful community climate change projects and sustaining community educators and organizers for the long haul. many photographs of action on the ground.

Download at https://naaee.org/eepro/resources/community-climate-change-education

We Are All Connected



"We Are All Connected" is a series that explores how we all live together in a shared balance upon Mother Earth. Each book explores a specific ecosystem with a focus on one animal and its adaptations for survival within that ecosystem. Indigenous interviewees, each living within the same area, have responded to strategic questions as to how their community interacts with the land, their traditional territory. Explore each text with a sense of inquiry in mind.

Each title covers:

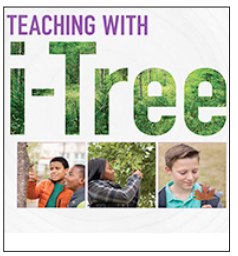
—Traditional storytelling and artwork begin each title from the focus Indigenous territory.

—Science: Biodiversity, classification, life cycles, food chains, food webs and connections between living and non-living things are just some of the science concepts included in each book.

—Social Studies: Contemporary and historical Indigenous cultural knowledge flows throughout each book. Local land forms, gatherings, harvesting practices and government are some of the social studies concepts included in each book.

To learn more, visit the Strong Nations website at https://www.strongnations.com/

New "Teaching with i-Tree" Curriculum from PLT



Project Learning Tree (PLT), in collaboration with the U.S. Forest Service, has produced Teaching with i-Tree a curriculum designed to engage middle and high school students in STEM (science, technology, engineering, and math) as they calculate the economic and environmental benefits of trees. Students input data they collect into a free online tool to calculate the dollar value of the benefits provided by a tree, or a set of trees.

The activities can be used in formal classroom settings or with non-formal groups, such as scouts and students enrolled in afterschool programs.

Learn more and download at https://www.plt.org/news/teaching-with-itree/.

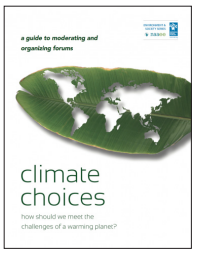
Knowing Home: Braiding Indigenous Science with Western Science

Knowing Home attempts to describe the creative vision of Indigenous scientific knowledge and technology that is derived from an ecology of a home place. The traditional wisdom component of Indigenous Science—the values and ways of decision-making—assists humans in their relationship with each other, the land and water, and all of creation. Knowing Home weaves Indigenous perspectives, worldviews, and wisdom practices into the science curriculum. It provides a window into the scientific knowledge and technological innovations of the Indigenous peoples of Northwestern North America, providing numerous examples and cases for developing science lessons and curricula. Knowing Home shows how Indigenous perspectives have the potential to give insight and guidance as we attempt to solve the complex environmental problems of the 21st century.

Knowing Home is available online or you can order a hard copy through the UVic Bookstore.

PDF versions are available at: https://dspace.library.uvic.ca:8443/handle/1828/7821

Grades 6-8



FREE DOWNLOAD: Climate Choices EIF in the Classroom Middle School Teacher Guide

Environmental Issues Forums (EIF) is an NAAEE initiative designed to promote meaningful, productive deliberation about difficult issues that affect the environment and communities. This middle school level teacher's guide provides an introduction to the EIF issue guide Climate Choices: How Should We Meet the Challenges of a Warming Planet? Using Climate Choices offers an opportunity for teachers and students to use a deliberative process to consider our climate choices. This resource provides background information on deliberation, how to use Climate Choices in the classroom, and material to help teachers moderate a forum with students. It also includes resources on teaching about climate change issues.

Download at https://naaee.org/eepro/resources/climate-choices-eif-classroom-middle-0

beetles
Science and Teaching for Field Instructors

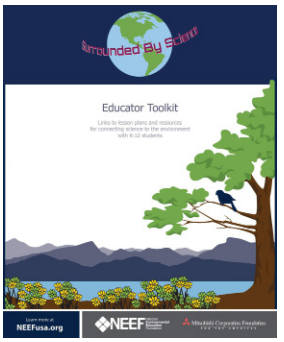
BEETLES Institute in Oregon

BEETLES (Better Environmental Education, Teaching, Learning, and Expertise Sharing) Institute will bring together leaders of outdoor school programs from across Oregon for a week of professional learning, expertise sharing, community building, discussions, and thoughtful reflection.

This Institute is a rich experience, and a unique opportunity to meet with other leaders and discuss ideas for how to make your program the best it can be. More information and applications are coming soon: http://onrep.forestry.oregonstate.edu/workshops

The workshop will be held March 3rd - 8th, 2019.

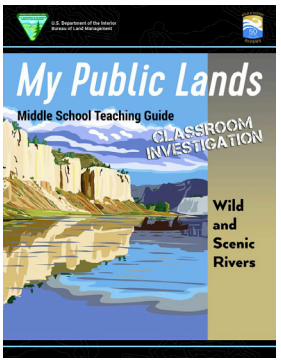
EE Resources



Surrounded by Science

If you've been following CLEARING for any time, you will know that Jim Martin has been writing a regular series on finding science curriculum in the world around them. This downloadable collection of lesson plans and curriculum guides from the National Environmental Education Foundation (NEEF) is designed to help educators introduce students to some of the many ways they can discover more of the science going on around them, both within the classroom and in the field.

https://www.neefusa.org/resource/surrounded-science-educator-toolkit

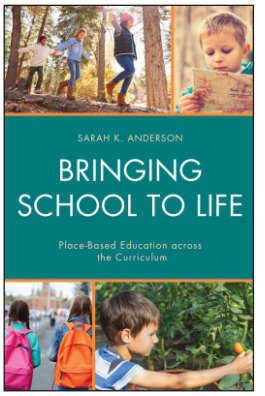


My Public Lands

America's Wild and Scenic Rivers, the latest teaching guide in the Classroom Investigation Series, helps teachers introduce students to the 50th anniversary of the National Trails System Act. As they take part in the guide's three activities, students find wild and scenic rivers, explore the history of the passage of the act, and develop their own river-inspired poetry. #FindYourWay

Download yours today: on.doi.gov/2ohBltm.

BOOK REVIEW



Enlivening Students

Review of Sarah Anderson's, *Bringing Schools to Life: Place-Based Education across the Curriculum* (Lanham, Massachusetts: Rowman & Littlefield, 2017)

by Gregory A. Smith

For the past two decades, books and articles written by place- and community-based advocates have been largely focused on defining and justifying an alternative approach to teaching and learning grounded in local knowledge and issues with the aim of inducting children into a sense of community participation and responsibility. This literature was largely exhortatory rather than prescriptive. It did not often provide interested teachers with detailed guidelines about how to move from a broad vision to the challenge of creating and enacting curriculum and instruction not limited by either textbooks or even classrooms. These advocates asked teachers to be courageous and take risks, trusting in their capacity to experiment and learn from their failures and successes. And many teachers across the United States and elsewhere became early adopters of this approach, willing to embrace those challenges and risks. As place- and community-based education enters its third decade, however, something more is needed to make its implementation appealing and understandable to a broader group of educators. Sarah Anderson's *Bringing Schools to Life: Place-Based Education across the Curriculum* (2017) provides exactly the kind of guidance required to accomplish this end.

Anderson is a former student of David Sobel, one of the early advocates of this approach. For the past dozen years she has embraced what she learned while studying with him first as a middle-school teacher and now as the fieldwork coordinator at the Cottonwood School of Civics and Science in Portland, Oregon. Anderson's work is especially powerful because of her concern about citizenship education and democratic practice. Place-based educators often focus primarily on providing students with immersive experiences in nature without necessarily engaging them in the cultural understandings, conflicts, problem-solving, and negotiation that accompany life in civil society. This is not to diminish the importance of those immersive experiences—which can be central to the development of a strong environmental ethic—but in themselves not enough to give young people the confidence or savvy required to become engaged community actors. Anderson's work exemplifies how this can happen and how schools and communities can truly "get better together."[1]

Her volume provides multiple examples of lessons and units she or the teachers she works with have developed and taught. Chapters describe ways that students can use maps to learn about their place, contribute to its human and environmental health through community science, learn directly about local history, partner with nearby agencies and organizations, explore the way different subject areas can be integrated to deepen knowledge and understanding, and develop a sense of connection with and empathy for one another and people beyond the school. The three chapters about mapping, citizen science, and local history provide detailed descriptions of units interested but uncertain teachers could profit from as they begin to incorporate local possibilities into their own work with students; they will be the focus of the remainder of this review.

Maps offer not only a good way to introduce children to their own place but to think about "What is where, why

there, why care?"[2] They naturally lead students to observe, collect data, and make inferences. At the Cottonwood School maps are integrated into the learning experiences of children at all grade levels. Early in the school year as a welcoming activity, everyone is invited to create and share personal maps of things special to them in their bedroom, home, neighborhood, or someplace away from home. Kindergarteners through second graders then create maps of their classroom and playground, sometimes using blocks and unix cubes to illustrate a space. Third graders map the school focusing on specific features such as sound. Fourth through sixth graders create maps to scale of neighborhood features such as parks and then compare and contrast in writing the data presented in their maps. Sixth graders map nearby features of their own choosing. They walk through the South Waterfront neighborhood and record the location of things like K9 restrooms (fire hydrants), bike racks, and food carts. They then create a formal illustrated map with compass roses and borders (and sometimes sea serpents in the Willamette River) to represent what they have found. Seventh and eighth graders go further afield and focus on the city and state. Given a map of the city's boundaries and different districts, they identify major bodies of water, traffic routes, and one personally significant place in each district. This leads into a more extensive exercise in which they choose one data set to map. Possibilities include population, temperature levels during a heat wave, city parks, or the location of Starbucks coffee shops. They are encouraged to think about who has access to which resources by comparing demographic maps that focus on race and ethnicity. Maps offer a way to synthesize disparate but related information as well as integrate a variety of subject matter.

The school's incorporation of community science offers similar opportunities to link lessons to students' lives and create learning experiences that allow for observation, analysis, and curricular integration. Community science involves identifying local phenomena or issues worthy of study and action and linking these topics to the Next Generation Science Standards. One year, seventh- and eighth-graders identified the problem of animal waste in the neighborhood as an issue they wanted to explore and investigate. As they ventured beyond the school for a variety of learning activities, they found nearby sidewalks both hazardous and smelly. They decided to do something about it. Their teacher divided the class into teams who performed different tasks: one counted all of the pet waste in a six-block radius, another researched the environmental toxins found in dog poop, a third team investigated Portland laws regarding the regulation of pet waste, and a fourth researched similar laws in other cities. Once students had all of this information in hand, they analyzed what they had found and brainstormed possible solutions. They then wrote letters to public officials recommending that the city provide more public education about this problem and enact bigger fines for people who violated laws already on the books. Their letters resulted in a meeting with officials in city hall, and their ideas were incorporated into a "petiquette" campaign that the city had already begun planning. Extended units like these offers students a chance to systematically explore a topic, do so in ways that allow them to see its relevance to their own lives, and then make a contribution to the broader community. Such experiences match the call by framers of the NGSS to apply scientific concepts and practices to real life circumstances.

One of Anderson's talents lies in her capacity to find ways to make the study of history local, as well. The third grade curriculum, for example, includes a focus on Native Americans. As part of that study, students visited the Oregon Historical Society, Portland State University's Department of Archeology, and a traditional Chinook longhouse at Ridgefield, a National Wildlife Refuge in Washington State less than an hour from the city. Returning to the school, they transformed their classroom into a longhouse with a "fire pit" in the middle of the room. They also participated in PSU's Archeology Roadshow where after having learned about the characteristics of meaningful exhibits at the Oregon Museum of Science Industry, they created a longhouse model and became the only K-12 students to share their work at an event otherwise populated with much older presenters. The opportunity to be involved with people beyond the school at PSU or City Hall demonstrates to children that they are as much citizens as anyone else in their community, lending them both a level of confidence and a sense of responsibility too absent in the education of this country's future adults.

Learning experiences like these are deeply engaging for students. Furthermore, they demonstrate to community members the capacity of children to make genuine contributions to their common life. Anderson's book offers a useful and inspiring roadmap for other educators interested in realizing this vision of place-based education themselves.

[1] Tagline for the Rural School and Community Trust, an organization that grew out of the Annenberg Rural Challenge, the first national effort in the 1990s aimed at disseminating the possibilities of place-based education.

[2] In Brian Baskerville's 2013 article, "Becoming Geographers: An Interview about Geography with Geographer Dr. Charles Gritzner (http://geography.about.com/od/historyofgeographty/fl/Becoming-Geographers.htm).

Gregory Smith is a professor emeritus of the Graduate School of Education and Counseling at Lewis & Clark College in Portland, Oregon. He has written numerous articles and books about environmental and place- and community-based education. He is a fellow of the National Education Policy Center at UC-Boulder, a member of the education advisory committee of the Teton Science Schools, and a board member of the Cottonwood School of Civics and Science.