

NGSS and Outdoor Education

Grade Level Guide - 4th Grade

CHILDREN'S
FOREST



CENTRAL
OREGON



Background



Central Oregon and its amazing array of beautiful rivers, bountiful snowpack, diverse vegetation, and fascinating geology gives teachers and students unlimited opportunities for using the natural world as an outdoor classroom. Studies have shown that learning in the outdoors can increase enthusiasm for learning, promote teamwork, build social and emotional skills, and even increase standardized test scores.

The new [Next Generation Science Standards](#) (NGSS) advocate for three-dimensional learning, which is good news for outdoor and environmental education. First, all grade levels have an emphasis on understanding the impacts humans have on Earth's systems as well as the connections among living things and the environment. Second, a number of the scientific practices, disciplinary core ideas, and crosscutting concepts in NGSS can be more effectively addressed through exploration and investigation of the natural world than in the classroom. With the implementation of NGSS happening in school districts across Oregon, now is a great time to build outdoor education into your curriculum.

In 2011, CFCO was created to introduce and engage all students in Central Oregon to the wonder, science, and adventure of nature. One of our primary objectives is to provide all youth first-hand connections with nature by providing meaningful, inspirational, and interdisciplinary education programs. Together our network of partners offer over 30 different outdoor education programs that connect students to nature, engage students in science practices, and deliver content knowledge about local natural resources issues.

Guiding Principles and Beliefs

- **Teacher's Choice.** Teachers should have a breadth of outdoor education programs to choose from, but choices should be informed by thoughtful alignment to NGSS.
- **Scaffolding Learning.** With so many opportunities, the series of outdoor education programs that students experience should build upon each other, not replicate each other. Teachers should work together to provide a thoughtful progression of experiences for students across grade levels.
- **Providing Equitable Experiences.** Outdoor education programs should be offered equitably within grade levels at schools and also across schools and communities. Students at different schools might not be participating in the exact same programs, but their experiences should be comparable and age-appropriate.
- **Depth over Breadth.** Modeled after the [Oregon Environmental Literacy Program](#) (OELP), you will not find an exhaustive list of every opportunity to learn outdoors while addressing NGSS. Instead, we promote the best practice of utilizing essential questions to encourage a depth learning about each concept. We have identified what we feel are the most tangible ways to address NGSS and promote outdoor learning and environmental literacy in students.



How to Use the Document



Grade Level Guides

Each grade level has a two-page guide for incorporating outdoor learning into NGSS. We believe that outdoor education programs should be just part of a unit of study, and that deeper learning of topics and questions should occur in the classroom as well as in the schoolyard or nearby natural areas. As such, for each grade we've focused on two to three NGSS Performance Expectations where classroom learning can be greatly enhanced by outdoor exploration and investigation. For each Performance Expectation, the guide proposes an "essential question" that helps provide focus and coherence for units of study.

In addition to essential questions, page 1 of each grade level guide provides a handful of schoolyard activities that align with NGSS and the suggested essential questions as well as ideas for incorporating math, english-language arts, social studies, and art. Page 2 of the Grade Level Guides lists the Outdoor Education Programs available in Central Oregon that align with NGSS for that grade level. Programs may be listed under more than one grade level when there is strong alignment to NGSS for those grade levels. It is essential that schools work together to create a thoughtful sequence of programs that don't replicate each other (see *NGSS and Outdoor Education: Creating an Outdoor Learning Map* at childrensforestco.org/programs).

IMPORTANT NOTE: Organizations may offer programs to more grade levels than are listed in this guide. In an effort to reduce duplication across grade levels, we've listed programs where we feel there is the strongest alignment to NGSS Performance Expectations.



4th Grade

Essential Questions

- How do internal and external structures support the survival, growth, behavior and reproduction of plants and animals? ([4-LS1-1](#))
- How has earth’s landscape changed over time? ([4-ESS1-1](#))
- How do natural forces cause landscape changes? ([4-ESS2-1](#))
- How does the use of natural resources affect people and the environment? ([4-ESS3-1](#))

Schoolyard/Classroom Activity Ideas

- Take hand lenses out into the school yard or local park to have students explore the different inner and outer structures of plants/bug/feathers/etc. and collect flowers/fruits/seeds to dissect
- Make observations of wildlife (bird beaks, fur/feather color, etc.) and construct arguments for how their structures help them survive
- Use stream tables to simulate and investigate the effects of water, wind, and ice on the landscape and explore how slope and other factors affect erosion
- Research local dams or biomass energy sources and learn about their impacts on the environment

Lessons and Resources

- CFCO 4th-5th grade Curriculum Kit - childrensforestco.org/curriculum
- [Project WILD](#) – Seeing is Believing
- [Project Learning Tree](#) – Tree Factory
- [Bird Beak Buffet](#)
- [Project Budburst](#) – [Operation Flower Dissection](#), [Root Roundup](#)
- [There Goes the Schoolyard](#)
- Stream Tables and Soil Studies Kit – CFCO Resource Co-op

Interdisciplinary Connections

MATH	ELA	SOCIAL STUDIES	ART
Recognize and draw a line of symmetry across diagrams of animals’ bodies Express measurements of areas affected by erosion in a larger unit in terms of a smaller unit	Write an opinion piece with supporting evidence on which type of energy source is least impactful to the environment Conduct a short research project on landforms in Central Oregon and how they were formed	Identify conflicts involving use of land, natural resources, economy, and competition for scarce resources Explain how people in Oregon have modified their environment and how the environment has influenced people’s lives	Draw a magnified view of different parts of a plant or organism Create a map of areas of the schoolyard or nearby park that experience erosion



4th Grade - Outdoor Education Programs (page 1)

PROGRAM	ORGANIZATION	NGSS PE					SCIENCE & ENGINEERING PRACTICE	DISCIPLINARY CORE IDEA	CROSSCUTTING CONCEPT	DESCRIPTION
		4-LS1-1	4-LS1-2	4-ESS1-1	4-ESS2-1	4-ESS3-1				
Project SNOW	Discover Your Forest	**	**	**			Arguing from Evidence	LS1.A, ESS1.C	Systems, Patterns	Observation of plant/animal adaptations for high elevation environment, investigation about origin of the Cascades
Lava Lands Tours	Discover Your Forest	**		**			Arguing from Evidence	LS1.A, ESS1.C	Systems, Patterns	Observation of plant/animal adaptations for multiple environments, observation of rock types
Upstream Project/ Stewardship Project	Upper Deschutes Watershed Council				**	**	Investigation, Models	ESS2.A, ESS3.A	Cause and Effect	Build models using stream tables to study watershed formation and erosion, investigation of health of riparian zones, data collection on water quality, study of impacts of dams on fish habitat and river systems
Stream-fed Rivers Stewardship	Trout Unlimited				**	**	Designing Solutions	ESS2.A, ESS3.B	Cause and Effect	Service-learning program with observation/ investigation of riparian areas and human impacts to streams, journaling, discussion about potential solutions to human impacts, and hands-on restoration project
Life in Cold Blood	Sunriver Nature Center	**					Arguing from Evidence	LS1.A	Structure and Function	Presentation about the anatomical structures unique to herps and their function in various environments, observation of life herps and their habitat
Birds of Prey	Sunriver Nature Center		**				Arguing from Evidence	LS1.D	Systems	Presentation about the importance of raptor's senses on their ecological niche, observation of live raptors and their habitat
Life in a Pond	Sunriver Nature Center	**					Arguing from Evidence	LS1.A	Systems	Presentation about the adaptations of freshwater animals and their specialized structures, observation of live amphibians and aquatic invertebrates
Desert Waters	High Desert Museum				**		Models	ESS2.A	Cause and Effect	Build models using stream tables to study erosion and deposition, watershed activity, design solutions to erosion

4th Grade - Outdoor Education Programs (page 2)

PROGRAM	ORGANIZATION	NGSS PE					SCIENCE & ENGINEERING PRACTICE	DISCIPLINARY CORE IDEA	CROSSCUTTING CONCEPT	DESCRIPTION
		4-LS1-1	4-LS1-2	4-ESS1-1	4-ESS2-1	4-ESS3-1				
Rockin Geology	High Desert Museum			**			Models	ESS1.C	Patterns	Presentation and activities about rock types, volcanoes, and local geologic landscape
Birds of Prey	High Desert Museum	**				Arguing from Evidence	LS1.A	Systems	Comparison activity of raptors vs non-raptors, owl pellet dissection, study of bird eggs, live animal	
Rock and Roll Outdoor Day	The Environmental Center				**	Investigations, Models	ESS2.A	Patterns, Cause and Effect	Build models using stream tables to study erosion and deposition, active games about erosion, observation and designing solutions to mitigate the effects of erosion and flooding, building models about Earth's processes	
Kokanee Karnival	Kokanee Karnival Youth Education Program	**	*			Investigations, Models	LS1.A, ESS2.A, ESS3.A	Systems, Structure and Function	Water quality testing, stream flow measurement, fish dissection, life cycle game, promoting safe and responsible angling and community stewardship.	
Traveling the Oregon Trail	High Desert Museum	Addresses Social Studies standards								Students learn about geography and critical decision-making skills, while simulating an experience on the Oregon Trail

* addresses the performance expectation, but is not the primary focus of the program

** the performance expectation is the primary focus of the program

Outdoor Education Programs - Quick Reference Guide

Program	Organization	Length (Days)	Location	Cost	Grades					
					K	1	2	3	4	5
Outdoor School	Camp Tamarack	3	Camp Tamarack							X
NatureHoods – “Bear” Necessities	Children’s Forest of Central Oregon	4	Schoolyard, nearby park	Free	X					
NatureHoods – Roots and Tails	Children’s Forest of Central Oregon	4	Schoolyard, nearby park	Free	X					
NatureHoods – Plants and Pollinators	Children’s Forest of Central Oregon	4	Schoolyard, nearby park	Free		X				
Plants and Pollinators	Discover Your Forest	2	Public land sites (varies)	Free			X			
Newberry National Volcanic Monument	Discover Your Forest	1	Lava Lands	Free					X	
Project SNOW	Discover Your Forest	1	Mt. Bachelor	Free				X	X	X
H2O Aquatic Insects	High Desert Museum	1	HDM or school	\$165-\$200	X	X	X			
Reptiles and Amphibians	High Desert Museum	1	HDM or school	\$165-\$200		X	X			
Batty About Bats	High Desert Museum	1	HDM or school	\$165-\$200	X					
Wild Weather	High Desert Museum	1	HDM or school	\$165-\$200	X					
Nature’s Innovations	High Desert Museum	1	HDM or school	\$165-\$200	X					
Erosion!	High Desert Museum	1	HDM or school	\$165-\$200			X			
Desert Dwellers	High Desert Museum	1	HDM or school	\$165-\$200			X	X		
Birds of Prey	High Desert Museum	1	HDM or school	\$165-\$200					X	
Rockin Geology	High Desert Museum	1	HDM or school	\$165-\$200					X	
Desert Waters	High Desert Museum	1	High Desert Museum	Free					X	
Traveling the Oregon Trail	High Desert Museum	1	HDM or school	\$165-\$200					X	
Fired Up!	High Desert Museum	1	High Desert Museum	Free						X
Kokanee Karnival	Kokanee Karnival Program	4-7	Multiple locations	Free					X	
Life in Cold Blood	Sunriver Nature Center	1	Nature Center or classroom	\$100-\$180	X			X	X	
Birds of Prey	Sunriver Nature Center	1	Nature Center or classroom	\$100-\$180	X				X	X
Life in a Pond	Sunriver Nature Center	1	Nature Center or classroom	\$100-\$180	X			X	X	X
Plant Detectives Outdoor Day	The Environmental Center	1	Skyliner Lodge, Shevlin Park	Free			X			
Habitat Explorers Outdoor Day	The Environmental Center	1	Skyliner Lodge, Shevlin Park	Free				X		
Changing Cycles Outdoor Day	The Environmental Center	1	Skyliner Lodge, Shevlin Park	Free					X	
Rock and Roll Outdoor Day	The Environmental Center	1	Skyliner Lodge, Shevlin Park	Free						X
Moving through the Chain Outdoor Day	The Environmental Center	1	Skyliner Lodge, Shevlin Park	Free						X
Spring-fed Rivers Stewardship Program	Trout Unlimited	4	Fall River, Metolius River	Free					X	X
The Upstream Project	Upper Deschutes Watershed Council	1-4	Deschutes, Tumalo, Whychus	Free	X	X	X	X	X	X
Student Stewardship Projects	Upper Deschutes Watershed Council	1-4	Deschutes, Tumalo, Whychus	Free	X		X	X	X	X

Outdoor Education Programs - Contact Information

Organization	Contact Information
Camp Tamarack	camptamarack.com Charlie Anderson, Director charlie@camptamarack.com (541) 633-9847
Children's Forest of Central Oregon	childrensforestco.org Katie Chipko, Executive Director katie@childrensforestco.org (541) 383-5592
Discover Your Forest	discoveryourforest.org Karen Gentry, Education and Volunteer Programs Director karen.gentry@discovernw.org (541) 383-4771
High Desert Museum	highdesertmuseum.org Erica Pelley, Associate Curator of Education epelley@highdesertmuseum.org (541) 382-4754 ext. 320
Kokanee Karnival Youth Education Program	kokaneekarnival.org director@kokaneekarnival.org
Sunriver Nature Center	sunrivenaturecenter.org office@sunrivenaturecenter.org (541) 593-4442
The Environmental Center	envirocenter.org Jackie Wilson, Sustainability Educator jackie@envirocenter.org (541) 385-6908 ext. 15
Trout Unlimited	deschutes.tu.org Darek Staab, Program Manager dstaab@tu.org (541) 480-6976
Upper Deschutes Watershed Council	restorethedeschutes.org Kolleen Miller, Education Director kmiller@restorethedeschutes.org (541) 382-6103 ext. 33

Resources for Field Trips and Outdoor Learning

Resource	Organization	Details
Funding for Transportation or Substitutes	Children's Forest of Central Oregon	School Engagement Fund childrensforestco.org/school-engagement-fund
	Oregon Forest Resources Institute	Bus Transportation http://learnforests.org/resource_article/online-reimbursement-form **Forests/Forestry must be the primary focus of the field trip
Kits and Field Equipment	Children's Forest of Central Oregon	Resource Co-op childrensforestco.org/resource-coop Birding, Plants, Wildlife, Soil Studies, Aquatic Investigations, Forest Ecology, Insects, Stream tables <i>Free</i>
	High Desert Museum	Travelling Trunks https://www.highdesertmuseum.org/traveling-trunks/ Water Cycle, Skulls and Pelts, Oregon Trail, Biomimicry, Water Quality with Vernier Probes <i>\$25 for 2 weeks</i>
	Sunriver Nature Center	Travelling Trunks http://www.sunrivernaturecenter.org/index.php/visit-the-nature-center/our-programs/school-programs Birds of Prey, Herpatology, Native Plants, Life in a Pond <i>\$100-\$120 (includes 30 minute presentation)</i>
Field Trip Locations	High Desert ESD	Skyliner Lodge http://www.hdesd.org/about/skyliner-lodge/ <i>Free for educational programs</i>
	Children's Forest of Central Oregon	Map of sites in Central Oregon http://www.childrensforestco.org/places/
Inclusion Assistance	Bend Park and Recreation District	BPRD can provide Therapeutic Recreation staff to assist with students with special needs. Please provide at least 1 month notice. Email katie@childrensforestco.org .
Curriculum	Children's Forest of Central Oregon	childrensforestco.org/curriculum
	Oregon Forest Resources Institute	Lesson plans, videos, and publications http://learnforests.org/
Grant/Project Funding	Children's Forest of Central Oregon	NatureHoods projects http://www.childrensforestco.org/naturehoods Up to \$1,000 grants for schools and community groups for habitat improvements, outdoor classroom spaces, or accessibility improvements for schoolyards and parks

Field Trip Planning Timeline and Tips

4-6 months in advance

- Contact program provider (organization offering the field trip) to schedule dates for your field trips. Some providers may be able to accommodate your trip with less notice, but popular trips often fill-up well in advance
- Contact your transportation department to reserve a bus for your field trip dates and get a cost estimate

2-4 months in advance

- Apply to the [School Engagement Fund](#) if you need funding for transportation or substitutes
- Reserve kits from the [Resource Co-op](#) if you need field equipment

1 month in advance

- Send permission slips home
- Recruit parent chaperone volunteers
- If you are teaching on the field trip, review curriculum with grade level team and determine responsibilities
- Connect with program provider to discuss program adaptations and accommodations for students with special needs

2 weeks in advance

- Confirm reservation with transportation department
- Meet with school nurse to compile a list of medical issues, allergies, and necessary medications for all students attending. If students have severe allergies and epi-pens, find out if the student can self-administer or if you need to do it.
- Make list of student groups (if you are splitting the group) and divide emergency contact/medical information into groups

1 week in advance

- Discuss field trip behavior rules with your students
- Give students a list of required items of the field trip
- Confirm itinerary with parent chaperones
- Make nametags for students

Day before

- Review field trip behavior rules with your students
- Pack items on the teacher packing list (below)

Tips:

- Work collaboratively with other grade levels at your school to provide a sequence of field trips that build upon each other (and don't duplicate each other)
- Communicate with the program provider in advance with any information about goals for the field trip, background knowledge the students have, and information about students with special needs.
- Choose parent chaperones wisely. Field trips require extra eyes and ears. Depending on the site, recruit one chaperone for every 5-10 students. The ideal chaperone is one who is engaged, responsible, and caring. Be sure that chaperones understand that they are there to manage their entire group, not just to spend time with their son or daughter.