

TEACHING ABOUT CLIMATE CHANGE WATER, TREES, AND WILDLIFE



A NOTE TO EDUCATORS

Climate change is a complex topic that can be intimidating to teach. However, understanding climate, including the ways it is changing and how that impacts the environment, is crucial to making informed decisions and building resilience. Environmental education is not isolated to water, forests or animals. It connects everything.

The resources listed in this document are meant to help you teach about climate change in a holistic way. They will provide your students with engaging educational experiences that will help them understand climate resilience for communities and the environment.

As leaders in environmental education, Project Learning Tree, Project WET, and Project WILD provide hands-on activities that grounded in our each of our environmental focuses. Each lesson is a stand-alone activity and can be taught by itself or as part of a larger unit. We encourage you to form lesson plans that fit your scope and sequence, using lessons from all three of our organizations to teach about the impacts of climate change on water, trees and wildlife in your local communities. We hope these lessons will inspire you and your students to develop innovative solutions to address challenges that are arising as a result of climate change.

We invite you to learn more about our organizations and the unique climate changes initiatives we are working on by visiting our websites:



project **WET**

PROJECT WET

www.projectwet.org

www.projectwet.org/climate



PROJECT LEARNING TREE

www.plt.org

www.plt.org/news/teaching-climate-change



ASSOCIATION of
FISH & WILDLIFE
AGENCIES

Project **WILD**

PROJECT WILD

www.projectwild.org

<https://www.fishwildlife.org/afwa-inspires/project-wild/wildlife-climate>

PROJECT WET ACTIVITY	PUBLICATION	SUMMARY	K-2	3 - 5	6 - 8 (MS)	9 - 12 (HS)
9 custom WET activities about climate change	<i>Climate, Water and Resilience Educators Guide</i>	Project WET's newest Educator Guide, Climate, Water and Resilience, contains nine activities to teach students the fundamental of climate change and its impacts on the ocean, communities, aquatic species, plants, disease and more. This guide also contains background information in the front of the guide to help educators better understand climate change and resilience.			•	•
8-4-1, One for All	<i>Guide 2.0. Adapted climate change version for Guide 2.0 available in Using Project WET to Teach Climate Resilience Lesson Plan</i>	Students will analyze eight water users and how climate change will impact these users and the community, coming up with a plan to help solve water challenges related to climate change. Create additional climate change obstacles for students as they move water through communities.		•	•	•
Blue River	<i>Project WET Curriculum and Activity Guide 2.0</i>	Find local streamflow data on USGS website to look at historical flow over time. https://waterdata.usgs.gov/nwis/sw (View the tutorial here.)		•	•	
Color Me a Watershed	<i>Project WET Curriculum and Activity Guide 2.0</i>	Through interpretation of maps, students observe how development can affect a watershed. This activity can be extended to look at how predicted vegetation changes due to changing climate may affect the hydrology of watersheds, as well as current mass changes in watershed land use types due to large wildfires.		•	•	•
Dirt to Dinner	Free to Download at store.projectwet.org . Also available in Using Project WET to Teach Climate Resilience Lesson Plan.	Students learn how water moves into, through and out of soil in a whole-body simulation to model water with soil, ground water, atmosphere and plants interactions taking into account changing precipitation and temperatures.			•	
Discover the Waters of Our National Parks	<i>Project WET Curriculum and Activity Guide 2.0</i>	Explore how a changing climate will affect our National Parks		•		
Get the Groundwater Picture	<i>Project WET Curriculum and Activity Guide 2.0</i>	Students learn about basic ground water principles as they create their own geologic cross section or Earth window. Use Part III of this activity to address how a changing climate adds to the problem of use and recharge. Find local data from USGS to localize: https://waterdata.usgs.gov/nwis/sw			•	
High Water History	<i>Guide 2.0. Adapted climate change version for Guide 2.0 available in Using Project WET to Teach Climate Resilience Lesson Plan</i>	The Annual Exceedance Probability (AEP), or the percent likelihood of a flood to occur, helps people to better understand 10-, 100- and 500-year floods, especially as the likelihood for major floods is expected to increase in many areas of the U.S.			•	

PROJECT WET ACTIVITY	PUBLICATION	SUMMARY	K-2	3 - 5	6 - 8 (MS)	9 - 12 (HS)
Invaders!	Updated Version available on Water Education Portal (accessible with Guide 2.0). Also available on Project WET's store (store. Projectwet.org)	How do warming waters affect native species and the influx of invasive species? Will existing native or invasive species in your area thrive with warmer waters or will you see new invasive species entering local waterways?			•	•
Macroinvertebrate Mayhem	<i>Project WET Curriculum and Activity Guide 2.0</i>	Macroinvertebrates can help indicate the changes in stream conditions that result from climate change. What stressors may occur due to changing water temperatures or rising/ falling water levels?		•		
Nature Rules!	<i>Project WET Curriculum and Activity Guide 2.0</i>	With warming oceans and the increasing greenhouse effect, changes are triggered in the jet stream and precipitation patterns to bring more frequent weather extremes to areas across the globe. Students will simulate a TV newscast through role-play that is dominated by the extreme weather events and will communicate the underlying influence on those events.			•	
Ocean Habitats	<i>Project WET Curriculum and Activity Guide 2.0</i>	Look at rising ocean temperatures and changes in acidification of the oceans—how will these changes impact the different zones and organisms in them? Students may also look at how the ocean acts as a sink for CO ₂ , changes in pH and the effect on calcium uptake for shell development.			•	
Piece It Together	<i>Project WET Curriculum and Activity Guide 2.0</i>	Students analyze and plot global temperature and precipitation distributions to determine climate patterns and how they influence human lifestyles. Focus on how patterns are changing or are predicted to change. What effect will climate change have on lifestyles?		•	•	
Snow and Tell	<i>Project WET Curriculum and Activity Guide 2.0</i>	This activity looks factors that influence the rate of snow melt. Examine how these factors are impacted by a warming planet. What does this mean for seasonal and annual stream flow?		•	•	•
Stormwater (Storm Water)	<i>Guide 2.0. Adapted climate change version for Guide 2.0 available in Using Project WET to Teach Climate Resilience Lesson Plan</i>	Students can consider how climate change is impacting their city or town, and learn what other cities in the United States are doing to build community resilience.		•	•	
Super Sleuths	<i>Guide 2.0. Adapted climate change version for Guide 2.0 available in Using Project WET to Teach Climate Resilience Lesson Plan</i>	Use this activity to teach about waterborne diseases and water related vector diseases in a changing climate. How can a changing climate affect the spread of these diseases?			•	•

PROJECT WET ACTIVITY	PUBLICATION	SUMMARY FOR USE	K-2	3 - 5	6 - 8 (MS)	9 - 12 (HS)
The Breathing Boreal Forest	Free to Download at store.projectwet.org . Also available in <i>Using Project WET to Teach Climate Resilience</i> Lesson Plan.	In this activity students play the role of coniferous trees. First they learn about seasonal freeze/thaw cycles and dormancy through a game of tag. Students then juggle complex environmental factors to try to survive a growing season in a changing climate. Connections between freeze/thaw cycles, photosynthesis and the global carbon cycle are explored.			•	
Water Address	<i>Project WET Curriculum and Activity Guide 1.0</i>	Students identify plants and animals and their habitats by analyzing clues that describe water-related adaptations of aquatic and terrestrial organisms. Examine how climate change is affecting these organisms.		•	•	
Water Concentration	<i>Project WET Curriculum and Activity Guide 1.0</i>	Through the familiar game of Concentration, students make connections between modern and past water use practices and discuss how attitudes toward water changed as water use practices evolved. Use a basic engineering extension – What do students think the next generation of home water technology will be in a changing climate?		•	•	
Water Messages in Stone	<i>Project WET Curriculum and Activity Guide 1.0</i>	Students replicate rock paintings and carvings to learn about ancient cultures' relation to water and to create their own water-related expressions. What messages were past cultures trying to say, especially in relation to water? Try this with etching on sandpaper our current relationship with water. Imagine what human's relationship with water will be in the future.		•		
Wet Vacation!	<i>Project WET Curriculum and Activity Guide 1.0</i>	Analyze temperature and precipitation trends over the last 50-100 years locally and/or at vacation spots. Use USGS data to add evidence: https://waterdata.usgs.gov/nwis/sw . What will these vacation spots look like in the next generation?		•	•	

PLT ACTIVITY	PUBLICATION	SUMMARY	K-2	3 - 5	6 - 8 (MS)	9 - 12 (HS)
Concepts of Forest Literacy	<i>Forest Literacy Framework</i>	These concepts represent a vision for what students should know about forests by the time they graduate high school. They are organized around four themes and include several concepts related to climate change.	•	•	•	•
Forest Literacy Plan Concepts for Grades 6-8	<i>Forest Literacy Framework</i>	These information pages outline concepts, essential questions, education standards, and sample activities that support key forest concepts for grades 6–8, including suggestions related to climate change.			•	
Forest Literacy Plan Concepts for Grades 9-12	<i>Forest Literacy Framework</i>	These information pages outline concepts, essential questions, education standards, and sample activities that support key forest concepts for grades 9–12, including suggestions related to climate change.				•
Forest Literacy Hot Topic: Climate Change	<i>Forest Literacy Framework</i>	This explainer outlines concepts and essential questions related to climate change and forests.	•	•	•	•
1: Stepping through Climate Science	<i>Southeastern Forests and Climate Change</i>	Students walk along a timeline of climate science and policy initiatives and then explore connections between forests and climate.				•
2: Clearing the Air	<i>Southeastern Forests and Climate Change</i>	After an introduction to the evidence of climate change, students explore common confusions and role-play a community discussion with the goal to reach consensus on strategies to reduce greenhouse gas emissions.				•
3: Atlas of Change	<i>Southeastern Forests and Climate Change</i>	Students are introduced to climate modeling to understand past changes and project future possibilities, and then use web resources to consider how forest ecosystems might change over the next 100 years.				•
4: The Changing Forests	<i>Southeastern Forests and Climate Change</i>	Students review how scientists are monitoring forest changes and exploring adaptive strategies to keep forests healthy.				•
5: Managing Forests for Change	<i>Southeastern Forests and Climate Change</i>	Students develop and use a systems diagram to model a forest so they can advise a forest landowner how to manage a pine plantation in light of climate projections.				•
6: Mapping Seed Sources	<i>Southeastern Forests and Climate Change</i>	Across the native range of loblolly pine, variations in genotype create trees that may do better under new climatic conditions. This activity helps students analyze data from three trials to determine the origin of the seeds.				•
7: Carbon on the Move	<i>Southeastern Forests and Climate Change</i>	Students become familiar with the carbon cycle and pathways that increase and decrease atmospheric carbon.				•
8: Counting Carbon	<i>Southeastern Forests and Climate Change</i>	Students measure trees near their schools and calculate the amount of carbon stored in individual trees. Students then compare the carbon sequestration potential for land-use types in their state, compare this to the estimated amount of carbon released by human activities, and discuss forests' ability to sequester atmospheric carbon.				•

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9: The Real Cost	<u>Southeastern Forests and Climate Change</u>	Through a simulated shopping activity, students learn about the impact, or externalities, of consumer choices on the environment.	•	•	•	•
10: Adventures in Life Cycle Assessment	<u>Southeastern Forests and Climate Change</u>	Students investigate life cycle assessment data for three types of outdoor dining furniture to determine which type would generate the lowest amount of greenhouse gases. This detailed analysis of inputs and outputs is another tool for systems thinking.			•	
11: Life Cycle Assessment Debate	<u>Southeastern Forests and Climate Change</u>	Students debate four pairs of similar products to develop their own sets of questions about product life cycles that can help guide consumer choices.				•
12: The Carbon Puzzle	<u>Southeastern Forests and Climate Change</u>	Students use a series of facts to realize how forest plantations, wood products, and wood substitution can reduce atmospheric carbon, and then interpret a graph published by the researchers who explored this concept.	•	•	•	•
13: Future of Our Forests	<u>Southeastern Forests and Climate Change</u>	Student teams review information from the module and share their knowledge with an appropriate audience.				•
14: Starting a Climate Service-Learning Project	<u>Southeastern Forests and Climate Change</u>	Students select and complete an action project to mitigate climate change or help their communities adapt to projected changes.				•
Here We Grow Again	<u>Explore Your Environment</u>	Students conduct inquiry-based experiments to explore how factors such as temperature, water, and soil affect plant growth.	•			
We All Need Trees	<u>Explore Your Environment</u>	Students explore some of the many different products we get from trees and learn how much we depend on trees in our daily lives.	•			
Every Tree for Itself	<u>Explore Your Environment</u>	Students engage in an active modeling simulation that demonstrates the conditions trees need to live and can be used to show the effects of climate change on tree resources.		•		
Tree Cookies	<u>Explore Your Environment</u>	Looking at a cross-section of a tree, students trace environmental and historical changes—including changes precipitation and temperature—evident in the tree's annual rings.		•		
Water Wonders	<u>Explore Your Environment</u>	Through modeling and an experiment, students explore the water cycle and consider how human activities such as climate change can affect the water cycle.		•		
Tree Factory	<u>Explore Your Environment</u>	In this activity, students model the structure of a tree and learn the function of different parts, including that leaves convert carbon dioxide from air and water into carbohydrates (sugar) and oxygen.		•		

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Environmental Justice for All	<i>Explore Your Environment</i>	Students propose actions to resolve various scenarios and then research issues related to environmental justice in their own state. They could focus on issues related to climate change.			•	
Exploration Energy!	<i>Explore Your Environment</i>	Students learn about the different sources of energy, including the pros and cons of their use, conduct an audit of the electricity they use in their own homes, and create an action plan to use energy wisely.			•	
Field, Forest, and Stream	<i>Explore Your Environment</i>	In this field investigation, students compare three different environments to see how nonliving elements (sunlight, temperature, soil moisture, wind, and water flow) affect living elements in an ecosystem.			•	
Global Goods	<i>Explore Your Environment</i>	By tracing the resources that go into making one item, students learn how its manufacture can have an impact on the environment.			•	
Invasive Species	<i>Explore Your Environment</i>	Students research invasive species to determine how these species got to their new locations and what characteristics make their control so challenging. They might also consider how changes in climate affect species invasions.			•	
Life on the Edge	<i>Explore Your Environment</i>	Students model processes that can lead to species becoming rare or endangered, including climate change and other forces, and create “public relations campaigns” on behalf of one of these species.			•	
Living with Fire	<i>Explore Your Environment</i>	Students learn about the three elements a fire needs to burn and find out how an understanding of this "fire triangle" can be used to both prevent and manage wildland fires. They could also focus on the impact of climate change on the frequency of wildland fires.			•	
Nothing Succeeds Like Succession	<i>Explore Your Environment</i>	Students investigate the connections among plants, animals, and successional stages in a local ecosystem, and learn how disturbances like climate change play a part in succession.			•	
Plant a Tree	<i>Explore Your Environment</i>	Students identify ways we depend on trees, including storing carbon and providing shade, and organize and carry out a tree-planting project.			•	
The Global Climate	<i>Explore Your Environment</i>	Students explore the relationship among CO ₂ , the Earth’s climate, and local ecosystems and suggest ways to reduce the effects of increased CO ₂ levels in the atmosphere.			•	
What’s in a Label?	<i>Explore Your Environment</i>	Students explore the environmental, social, and economic criteria of forest certification and consider possible benefits and limitations of certification for both forests and people—including helping to mitigate climate change.			•	

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28: Air Plants	<i>PreK-8 Environmental Education Activity Guide</i>	This activity helps students understand the process of photosynthesis and how people and plants depends on this process for oxygen.		•	•	
39: Energy Sleuths	<i>PreK-8 Environmental Education Activity Guide</i>	Students learn about the different sources of energy, advantages and disadvantages to their use, and how energy is used in their daily lives, allowing them to access the relationship between their energy use and CO ₂ emissions.	•	•	•	
48: Field, Forest, and Stream	<i>PreK-8 Environmental Education Activity Guide</i>	In this field investigation, students compare three different environments to see how nonliving elements (sunlight, temperature, soil moisture, wind, and water flow) affect living elements in an ecosystem.	•	•	•	
73: Waste Watchers	<i>PreK-8 Environmental Education Activity Guide</i>	Students conduct an audit of the energy they use in their homes and create an action plan to reduce energy use.		•	•	
81: Living with Fire	<i>PreK-8 Environmental Education Activity Guide</i>	Students learn about the three elements a fire needs to burn and find out how an understanding of this “fire triangle” can be used to both prevent and manage wildland fires. They could also focus on the impact of climate change on the frequency of wildland fires.		•	•	
84: The Global Climate	<i>PreK-8 Environmental Education Activity Guide</i>	Using data collected from Mauna Loa, students graph changes in atmospheric CO ₂ over a 46-year period, and identify possible reasons for those changes. They also learn about the relationships between CO ₂ and the Earth’s climate, and explore ways to reduce the amount of CO ₂ they generate.			•	
85: In the Driver’s Seat	<i>PreK-8 Environmental Education Activity Guide</i>	Students keep a log of their family’s transportation for a week, then explore fuel conservation and energy efficiency by modeling the distance they can travel using different vehicles.		•	•	
86: Our Changing World	<i>PreK-8 Environmental Education Activity Guide</i>	Students make a graphic organizer connecting natural resources, energy, and human activities. They also research a global issue, such as climate change, to gain an understanding of issues facing us today as a global society.		•	•	
88: Life on the Edge	<i>PreK-8 Environmental Education Activity Guide</i>	Students model what happens when habitat is altered either naturally or by humans, and create public relations campaigns on behalf of endangered plants or animals. They could focus their study on issues related to climate change.		•	•	
95: Did You Notice?	<i>PreK-8 Environmental Education Activity Guide</i>	Students study changes in their local environment over short and long time periods and identify patterns of change.	•	•	•	

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1: What Is Climate?	<i>Carbon & Climate E-Unit</i>	Students explore the concept of climate as they examine global climate patterns and the relationship between temperature, precipitation, and the world's forests.			•	
2: The Carbon Cycle	<i>Carbon & Climate E-Unit</i>	Students model the movement of carbon atoms in the carbon cycle and explore the relationship between atmospheric carbon and plants.			•	
3: Is It Only Natural?	<i>Carbon & Climate E-Unit</i>	Students examine various factors that have caused climate change in the past, analyze carbon dioxide levels over time, and construct a claim, supported with evidence and reasoning.			•	
4: Climate Time Machine	<i>Carbon & Climate E-Unit</i>	In this project-based learning activity, students explore the geologic history of a particular region of the world to see how past climatic changes have altered the landscape. Students create museum exhibits to model what earlier climate patterns can reveal about current global temperature trends.			•	
5: Are You a Big Foot?	<i>Carbon & Climate E-Unit</i>	After examining projections for different forest regions in the United States, students use a carbon footprint calculator to analyze their personal contribution to carbon dioxide levels in the atmosphere and design a solution for reducing their carbon footprint.			•	
Plant a Tree	<i>Learn About Forests</i>	Learners identify ways we depend on trees, including storing carbon and providing shade, and organize and carry out a tree-planting project.		•	•	•
Seeking Sustainability	<i>Learn About Forests</i>	Learners examine the United Nations' Sustainable Development Goals, whose aim is to tackle change by the year 2030, and identify how trees and forest are connected to each goal.		•	•	•
Tree Cookies	<i>Learn About Forests</i>	Looking at a cross-section of a tree, learners trace environmental and historical changes—including changes precipitation and temperature—evident in the tree's annual rings.		•	•	•
Who Works in the Forest	<i>Learn About Forests</i>	Learners explore a variety of careers related to forests, including a carbon modeler.		•	•	•
3: Monitoring Forest Health	<i>Green Jobs</i>	Through a variety of health indicators, learners assess the health of a forested area, and see how soil scientists, wildlife biologists, arborists, and other forest professionals monitor forests. They could focus their assessment on climate change effects.			•	•
4: Seeking Sustainability	<i>Green Jobs</i>	Learners explore the concept of sustainability by examining the United Nations' 17 Sustainable Development Goals, while also taking a look at some jobs involved in ensuring forest sustainability. They could focus their examination on issues related to climate change.			•	•

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1: Tree Benefits and Identification	<i>Teaching with i-Tree</i>	Using an online tool, students quantify the benefits that trees provide, including carbon storage.			•	•
3: Land Manager Role Play	<i>Teaching with i-Tree</i>	Students develop a plan for increasing the number of trees on school grounds based on identified goals. Students could base their plan around reducing carbon emissions.			•	•
Follow Your Nose	<i>Trees & Me</i>	These experiences introduce children to the products we get from trees, focusing on ones they can smell and taste.	•			
Fall for Trees	<i>Trees & Me</i>	In these experiences, children explore the concept of climate and seasonal changes by looking for signs of autumn and playing with falling, changing, and dancing leaves.	•			
Evergreens in Winter	<i>Trees & Me</i>	Children explore evergreen trees and the season of winter in these experiences, helping to further their understanding of climate.	•			
Best Buds	<i>Trees & Me</i>	Children explore twigs, buds, and tree flowers while they celebrate the coming of spring in these experiences.	•			
Parts to Play	<i>Trees & Me</i>	Children experience the different parts of trees and begin to understand that each part plays a role in the tree's ability to live, including how leaves make food for the tree.	•			
Three Cheers for Trees	<i>Trees & Me</i>	In these experiences, children explore the many products and benefits that trees provide.	•			
Energy	<i>Green Schools Investigations</i>	In this student-driven investigation, students investigate how much energy their school uses, the main sources of energy for the school, and ways to implement energy-saving strategies.		•	•	•

PROJECT WILD ACTIVITY	PUBLICATION	SUMMARY	K-2	3 - 5	6 - 8 (MS)	9 - 12 (HS)
Note for review:	Activity already helps students draw direct connections between climate change and wildlife					
	Existing extension addresses climate change					
	Includes suggestion for adapting or extending the activity to address climate change					
Aquatic Times	<i>Aquatic WILD K-12 Curriculum & Activity Guide</i>	Create an aquatic themed newspaper by conducting research and writing articles on aquatic-related issues for a classroom newspaper. Students could focus on climate change and impacts to aquatic ecosystems.			•	•
Conservation Messaging	<i>Aquatic WILD K-12 Curriculum & Activity Guide</i>	Create public service announcements to educate the community about threats to aquatic wildlife and actions citizens can take to help address issues. Students could focus on climate change impacts, adaptation, and mitigation.			•	•
Hooks and Ladders	<i>Aquatic WILD K-12 Curriculum & Activity Guide</i>	Move through a migration obstacle course to simulate the limiting factors that salmon endure during their life cycle. Include an option to mimic climate change impacts, such as decreased habitat due to rising stream temperatures in some areas. Narrow the playing area where the predators are located.			•	
Migration Headache	<i>Aquatic WILD K-12 Curriculum & Activity Guide</i>	Simulate the migration of water birds by “flying” through an obstacle course to understand the limiting factors birds experience during their journey. Add a climate related-scenario, e.g.: Sea level rise means less freshwater wetland habitat is available to provide food. Remove one “habitat haven” from the wintering habitat.			•	
Pond Succession	<i>Aquatic WILD K-12 Curriculum & Activity Guide</i>	Create murals to illustrate the ecological succession of a pond over time. For a climate extension, discuss how warming temperatures will cause various habitats to change over time.			•	
Turtle Hurdles	<i>Aquatic WILD K-12 Curriculum & Activity Guide</i>	Simulate the migration of sea turtles by migrating through an obstacle course to understand the limiting factors sea turtles experience during their journey. For a climate extension, mark the nest zone clearly with a rope circle, or using paper plates that students must stand on. While the turtles are migrating, decrease the size of the nest zone to represent sea level rise reducing the area available for nesting sites. Turtles who return and cannot find space in the nest zone die without reproducing.		•	•	
Climate and Wildlife	<i>Climate and Wildlife</i>	This activity module provides a collection of Project WILD activities that address eight key goals in climate adaptation through the lens of wildlife conservation.			•	•

PROJECT WILD ACTIVITY	PUBLICATION	SUMMARY	K-2	3 - 5	6 - 8 (MS)	9 - 12 (HS)
Bird Hurdles	<i>Flying WILD: An Educator's Guide to Celebrating Birds</i>	Navigate your way through an obstacle course to understand the dangers wild birds face. After one round, in the "Hunt for Your Home" shrinking habitat part, remove a hoop and place the remaining hoops a bit further apart. Climate change has made some breeding and wintering areas no longer suitable. Can the birds adapt?		•	•	
Hidden Hazards	<i>Flying WILD: An Educator's Guide to Celebrating Birds</i>	Students embark on a journey through an obstacle course to describe major threats to bird species. Between rounds in this migration simulation, discuss with students how a warming climate can change the timing of nature's annual cycles (a changing phenology). How might warmer temperatures affect when food sources (such as flowers or caterpillars) are available for some migrating birds? Remove a portion of the food tokens (such as 40%) to represent a loss of available food due to changing phenologies.		•	•	•
Teaming Up for Birds	<i>Flying WILD: An Educator's Guide to Celebrating Birds</i>	Research wild bird conservation organizations and create a plan to form one of your own. During the research, look for strategies bird conservation organizations use in response to climate change. What strategies will your organization use to help conserve bird species in response to a warming climate?			•	•
A Dire Diet	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Become wildlife and experience possible consequences of pesticide accumulation in the environment, then investigate the effectiveness of regulations to control pesticide use. See the In Step with STEM extension for a climate connection.			•	
A Home Away from Home	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Design a zoo habitat that provides all the necessary elements for a polar bear to survive in Phoenix. As habitats change due to global warming, animals will have to move or adapt in order to find food, water, shelter, and space. Are any animals in your state becoming more rare or more prevalent as their ranges shift? What habitat changes might be causing this? See the In Step with STEM extension for more climate connections.			•	
A Picture Is Worth a Thousand Words	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Analyze pictures over time to explore how scientific knowledge and technological advancements change attitudes toward wildlife. Include pictures that relate to climate change (species impacted, technology used to study climate change) to discuss complexities of managing wildlife in a changing climate.			•	•
Back from the Brink	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Read about the American alligator, black-footed ferret, and gray wolf and examine issues related to the decline and recovery of threatened and endangered species. See In Step with STEM for a climate connection.				•

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Bat Blitz	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Simulate bats feeding on insects and perform calculations to learn about one of the roles bats play in an ecosystem. For a climate extension, perform variation 5. Discuss how temperature affects food availability. How might warmer winter temperatures impact the bat population and behavior?		•	•	
Birds of Prey	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Interpret data on wildlife populations and climate to recognize the interdependence of a healthy, functioning ecosystem.				•
Bottleneck Genes	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Using a bottle, colored beads, and environmental scenario cards, investigate how genetic diversity within a population affects a species' ability to adapt and survive. See the In Step with STEM section for a climate connection.			•	•
Carrying Capacity	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Using a bottle, colored beads, and environmental scenario cards, investigate how genetic diversity within a population affects a species' ability to adapt and survive. See the In Step with STEM section for a climate connection.			•	•
Checks and Balances	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Acting as wildlife managers, students play a card game and perform calculations to understand factors affecting a herd of animals. Encourage students to consider climate change impacts and mitigation strategies on their condition and management scenario cards.			•	
Eco-Enrichers	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Design and conduct an experiment to investigate soil types and organisms found in soil. Soil is an important part of the carbon cycle. Taking good care of soil can increase the soil's capacity to absorb atmospheric carbon that contributes to global warming. See extension 3 to learn about composting and building up healthy soil. Does adding compost to a soil sample impact the results of the investigation? How so?			•	•
Ecosystem Architects	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Design an ecosystem restoration project to improve habitat and biodiversity in a fictional scenario. See extension 4 for a climate connection.			•	•
Fire Ecologies	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Carry out an investigation of burned and unburned habitat areas to evaluate the positive and negative effects fire has on wildlife and habitat. See extension 3 for a climate connection.				•
Food Footprint	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Construct a flow diagram to trace the origins of food sources, consider impacts of production, and recommend improvements.			•	•

PROJECT WILD ACTIVITY	PUBLICATION	SUMMARY	K-2	3 - 5	6 - 8 (MS)	9 - 12 (HS)
Forest in a Jar	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Conduct a simple investigation using a jar, soil, water, seeds, and a plant to explain the process of ecological succession. See the second STEM bullet to explore how varying moisture impacts the plant communities. Look online for long-term precipitation trends in your area. How might changes in precipitation levels from year to year impact succession?			•	•
Graphanimal	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Tally the diversity of animals on a nature walk to compare different environments. For young learners, this activity can help lay the groundwork for future understanding of climate change impacts on wildlife.	•			
Habitat Heroes	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Take action in your community by designing and completing a habitat improvement project. See extension 1 for climate connections.		•	•	•
Here Today, Gone Tomorrow	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Identify reasons that wildlife become vulnerable to extinction and assess the vulnerability of various species.			•	•
Keeping Cool	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Use thermometers in an investigation to explore how reptiles adapt to temperature changes. Look online for long-term temperature data in your area. Do you notice any trends? How might changes in average temperatures from year to year impact the reptiles in your area?		•		
Let's Talk Turkey	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Using background information cards, construct a timeline chronicling societies' historical use of the wild turkey. See In Step with STEM for a climate extension.		•	•	
Lights Out!	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Learn about light pollution and its impacts, and design an action plan to reduce light pollution in your community. As part of a school light audit, research and estimate the amount of carbon dioxide released when electricity is generated to produce outdoor lighting at your school. What light sources are necessary, and what types of lighting use less energy? In addition to light pollution, what other non-climate stressors can you help reduce to help fish, wildlife, plants, and ecosystems adapt to a changing climate. How can you engage your community in reducing light pollution?		•	•	•
Limiting Factors: How Many Bears?	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Simulate bears gathering habitat components to determine limiting factors for the given population. See extension 4 for a climate connection.		•	•	

PROJECT WILD ACTIVITY	PUBLICATION	SUMMARY	K-2	3 - 5	6 - 8 (MS)	9 - 12 (HS)
Migration Barriers	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Using a real-life example, make recommendations based on the consequences of developing a highway through a deer migration path. See extension 3 for a climate connection.			•	•
Monarch Marathon	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Students simulate the multi-generational monarch butterfly migration and experience the limiting factors affecting monarch survival. See extension 3 for a climate connection.		•	•	
Muskox Maneuvers	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Simulate adaptations in predator and prey relationships in a game of “flag tag.” See extension 1 for a climate connection.		•	•	
Natural Dilemmas	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Read hypothetical dilemmas concerning wildlife and the environment, and discuss different courses of action based on one’s values and beliefs. Be sure to include the cards connected to climate change and greenhouse gas emissions: pg. 300 bottom left and right, pg. 301 middle left and right and bottom left, pg. 302 top right, pg. 303 bottom right - create your own!			•	•
Oh Deer!	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Students become deer and habitat components in a physical activity that demonstrates population fluctuations, carrying capacity, and limiting factors. Include a couple of rounds with examples of how carrying capacity is affected by climate change. For example, warmer winter temperatures may increase the carrying capacity of a habitat for white-tailed deer (longer growing season). The same warm winters may decrease the habitat’s carrying capacity for moose as the warmer temperatures allow ticks to thrive (parasitism), to the detriment of the moose calves.		•	•	•
Phenology at Play	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Perform skits and graph data to understand effects of climate change on phenology and a migratory bird population.			•	•
Raindrops and Ranges	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Create digital maps to explore interrelationships among rainfall, vegetation, and wildlife species.			•	•
Smokey Bear Said What?	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Create a mural to illustrate an ecosystem before, during, and after a fire. After students complete the murals, discuss where and when carbon is stored and released in the mural. See STEM bullet three to further discuss fire and carbon.		•	•	
Surprise Terrarium	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Make observations of live animals to learn about camouflage and adaptations that help animals survive. For young learners, this activity can help lay the groundwork for future understanding of climate change impacts on wildlife.	•			
The Power of Planning	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Create a concept map to evaluate various energy sources, and then advocate for an assigned form of energy production during a simulated city council meeting.			•	•

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Time Lapse	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Create a diagram that depicts changes in species diversity as an ecosystem undergoes succession. Include extension 3 for a climate connection.		•	•	
To Zone or Not to Zone	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Simulate a county commission meeting to understand the complexities of land-use planning and decision making. See extension 1; have students research and create a scenario that deals with zoning and climate change.			•	•
Water Mileage	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Perform calculations to understand how adaptations enable animals to survive in harsh environments. Include extension 2 to focus on impacts of climate change.			•	•
What Bear Goes Where?	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Create posters of three different bear habitats to illustrate that animals are adapted in order to live where they do. For young learners, this activity can help lay the groundwork for future understanding of climate change impacts on wildlife.	•			
World Travelers	<i>Project WILD K-12 Curriculum & Activity Guide</i>	Plan and carry out an investigation in your schoolyard to identify native and nonnative plant populations, examining the positive and negative effects of their presence. Select extension 1 or 2 to observe changes over time. What ecological factors may account for the increase or decrease in non-native species? How could students design an experiment to test those factors?			•	•

