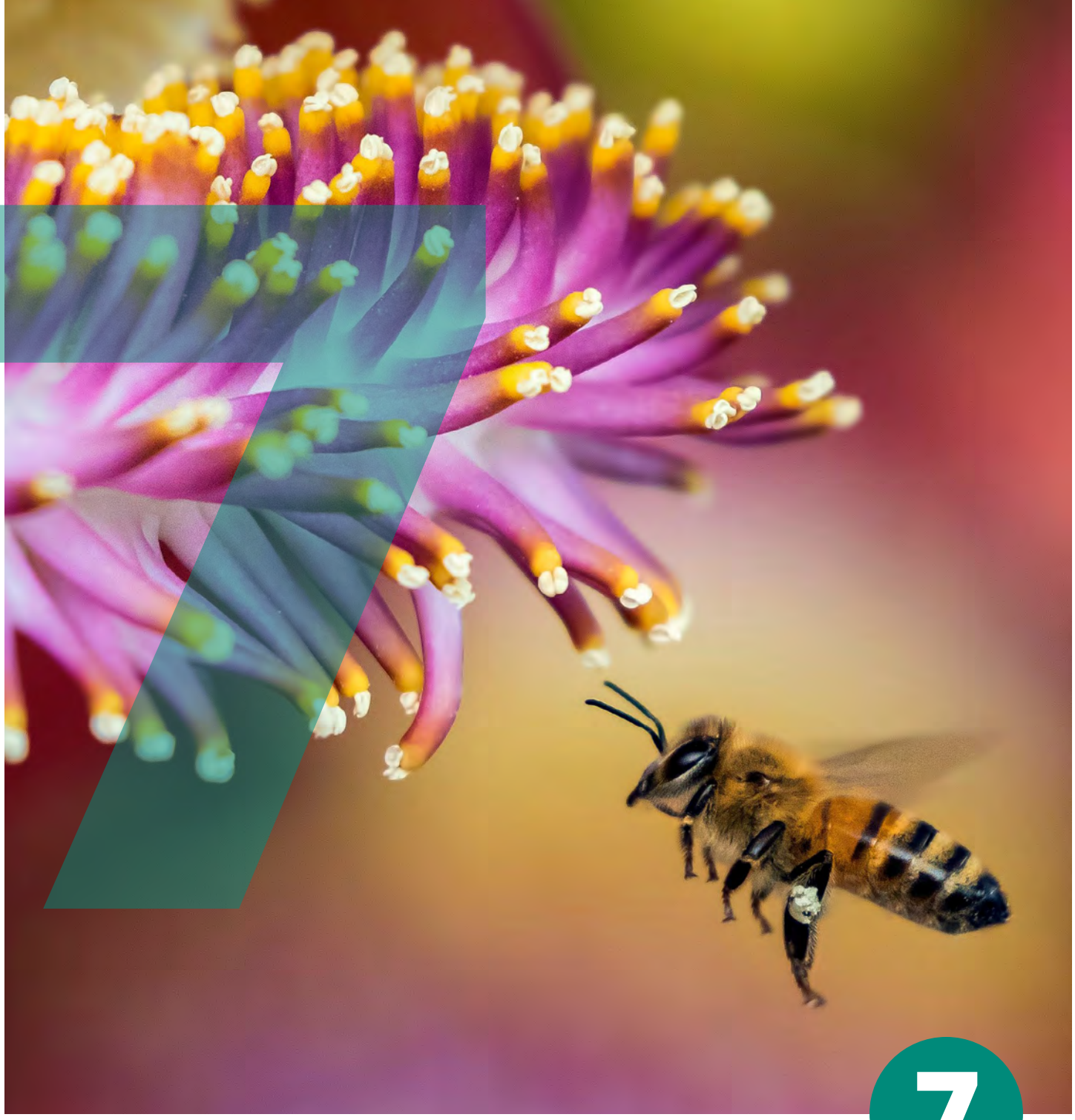

7

Guidelines for Excellence

Educating for Climate Action and Justice

naaee
North American Association
for Environmental Education

For more than five decades, the **North American Association for Environmental Education (NAAEE)** has been a leader in promoting excellence in environmental education throughout North America. With members in over 45 countries and affiliations with more than 52 state, regional, and provincial environmental education organizations, NAAEE's influence stretches across North America and worldwide. Our mission is to use the power of education to advance environmental literacy and civic engagement to create a more just and sustainable future. We work with educators, policymakers, and partners throughout the world. NAAEE supports the field with a variety of programs and services, including:

Annual Conference and Research Symposium—NAAEE has convened an annual conference for environmental education professionals since 1972. The conference is the largest international gathering of environmental education professionals in North America. It promotes learning and innovation in the field, networking, new tools and resources, and dissemination of research and effective practices.

Resources and eePRO—Through eePRO, our online professional development hub, NAAEE provides its members and supporters with high-quality professional resources at national and international levels, including books, resource guides, essays, peer-reviewed research, best practices, research reviews, job listings, grant opportunities, news across the field, and more.

Professional Development—NAAEE offers a number of opportunities for professional development and support. Through online networking and professional learning, training seminars, online learning modules, strategic convening of environmental education leaders, and support of certification programs, NAAEE promotes leadership development and builds the capacity of the field.

Policy—NAAEE is a non-partisan organization that plays a leadership role in raising the profile of environmental education at the state/provincial, regional, national, and international levels. NAAEE works with partners to advocate for environmental education with agencies, organizations, foundations, and others to increase funding and support for the field.

Inspiring Innovation—NAAEE is committed to bringing new voices, ideas, and innovation to the field and broadening environmental education's reach and impact.

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Guidelines for Excellence

Educating for Climate Action and Justice

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North American Association
for Environmental Education

Educating for Climate Action and Justice: Guidelines for Excellence is part of a continuing series of documents published by the North American Association for Environmental Education (NAAEE) as part of the National Project for Excellence in Environmental Education. The project is committed to synthesizing the best thinking about environmental education through an extensive review and discussion process. Hundreds of individuals and organizations representing all aspects of environmental education reviewed working outlines and drafts.

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NAAEE is a nonprofit organization dedicated to advancing environmental literacy and civic engagement to create a more equitable and sustainable future for all.

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Guidelines for Excellence
Educating for Climate Action and Justice

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This project would not have been possible without the support of hundreds of individuals and organizations that gave their guidance, reviewing draft versions of the guidelines, and providing background information, leads on case studies, and references.

We also want to give a giant thank you to Brock Adler for his decades of support of climate change and civic engagement education, including his generous support of these guidelines.

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Guidelines for Excellence

Educating for Climate Action and Justice

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A Note from the Writing Team

Developing these guidelines has been both an individual and collective journey for the members of the writing team. We embarked on this journey with the desire of crafting a set of recommendations—informed by research as well as input from hundreds of people and organizations around the world—that would guide educators as they facilitate effective climate education focused on climate action and justice.

The development process has confirmed that we must move beyond educating **about** climate change toward educating **for** climate action and justice. While remaining true to a core of collaborative, learner-centered, and inclusive educational principles, we were also committed to making this document relevant to a variety of individuals and organizations who support learners as they make informed decisions and take actions collectively to address our changing global climate. The urgency of this work has been a priority throughout our process.

We offer these guidelines with great humility. We are a small team of environmental education and climate justice professionals. We recognize that the guidelines build on the work of many environmental justice advocates who helped to prepare the way to make such a publication possible. Throughout the process, we also relied on feedback from reviewers and our Advisory Committee. But, in the end, our expertise and experiences guided the crafting of what we hope will facilitate climate action and justice across many different settings.

We know that words matter. The team had numerous conversations about using specific words and how we might describe particular situations. We have done our best to avoid problematic language and be accurate in how we use words without offending or reinforcing negative stereotypes. However, even with the best intentions, we acknowledge that how words are used and received depends on those involved. We also realize that word usage and meaning change over time. As we receive feedback, we will consider the suggested changes. We want this to be a living document that continues to improve.

Twelve educators from North America made up the writing team. Even though we received feedback from around the globe and strived to incorporate these perspectives, this document reflects a predominantly North American perspective and resources. We hope that educators outside of North America find our recommendations helpful. We invite you to adapt and adopt them as appropriate for your context.

Above all, we believe in the power of education. We hope this set of recommendations and related resources support a wide range of educators as they facilitate effective climate education focused on climate action and justice.

Introduction

Introduction



- In New Orleans, neighborhood residents participate in water-wise green infrastructure training, tour local green infrastructure projects, and attend visioning sessions to identify green infrastructure projects in their neighborhoods. The result is more than 120 projects that help manage stormwater, thereby reducing localized flooding. The projects often begin at the homes of residents and expand to small businesses, churches, community centers, vacant lots, and public rights-of-way (see page 87).
- Historically, Pu'uloa, the area known to nonnatives as Pearl Harbor (Hawaii), was a vibrant ecosystem. However, a changing climate, overuse from population increases, and growing tourism have negatively altered the native ecosystem. Mālama Pu'uloa, a nonprofit organization, engages community members of all ages in learner-centered, land-based programs that involve working to restore the land. This holistic, sustainable approach provides an innovative pathway to restoring the region to `āina momona—thriving land, thriving people (see page 24).
- In New York City, middle and high school students from neighborhoods with limited healthy food access learn how to build and maintain indoor hydroponic farms, each capable of growing up to 10,000 pounds of produce annually. This food is then served daily at school lunch and distributed to nearby community residents, reducing the need to use fuel to bring food from more distant farms, providing more nutritious options, and empowering students to lead themselves and others toward healthier futures. (see page 20).

Educating for Climate Action and Justice: Guidelines for Excellence was developed for the many individuals and organizations who facilitate climate education. Education, in all its various forms, can raise awareness and understanding of climate change, its causes, impacts, and potential solutions. Effective education can instill hope, build skills (e.g., communication, problem-solving, negotiation, self-reflection, and conflict resolution), increase social-emotional capacities, and energize learners of all ages to work on reducing risk and strengthening their communities—whether they are residents in New Orleans, community members in Hawaii, or students in New York. With this set of guidelines, we offer suggestions for creating more inclusive and equitable learning environments that support learners as they make informed decisions and take collective actions to address our changing global climate.

You can also find a selection of Supporting Resources (starting on page 112) to help you deliver effective climate education programming.

RESOURCES YOU CAN USE

Glossaries

Climate change and climate change education involve a lot of different terms, some of which may be unfamiliar. Throughout the Guidelines, we have included informational boxes titled "DID YOU KNOW?" Many of these boxes offer definitions of key terms.

For more definitions of key climate change terms, you may want to access these glossaries.

- BBC. *Climate Change Glossary*. 2023. Retrieved from https://www.bbc.com/news/science-environment-11833685
- NASA Global Climate Change. Vital Signs of the Planet. *Glossary*. n.d. Retrieved from https://climate.nasa.gov/glossary/?page=0&per_page=9999&order=title+asc&search=&alpha=A-Z%3Atitle
- UNICEF. *Climate Glossary for Young People*. 2020. Retrieved from https://www.unicef.org/lac/media/19321/file/climate-glossary-for-young-people.pdf
- University of California Davis. *Climate Change Terms and Definitions*. 2023. Retrieved from https://climatechange.ucdavis.edu/climate/definitions

DID YOU KNOW?

Sustainable Development Goals

At the core of the 2030 Agenda for Sustainable Development, adopted by world leaders, are 17 Sustainable Development Goals (SDGs) that call on all countries to mobilize efforts to:

> *...secure a sustainable, peaceful, prosperous, and equitable life on earth for everyone now and in the future. The goals cover global challenges that are crucial for the survival of humanity. They set environmental limits and set critical thresholds for the use of natural resources. The goals recognize that ending poverty must go hand-in-hand with strategies that build economic development. They address a range of social needs including education, health, social protection, and job opportunities while tackling climate change and environmental protection. The SDGs address key systemic barriers to sustainable development such as inequality, unsustainable consumption patterns, weak institutional capacity, and environmental degradation.*

Climate education works towards a sustainable future for all, where environmental and social responsibility drives individual and institutional choices. Embracing the SDGs and the Greening Education Partnership, education engages learners in meaningful investigations of how to ensure environmental quality, social equity, and economic prosperity.

Source: United Nations. *Transforming Our World: The 2030 Agenda for Sustainable Development. 2015*. Retrieved from https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf

UNESCO. Greening Education Partnership. 2024. Retrieved from https://www.unesco.org/en/sustainable-development/education/greening-future

DID YOU KNOW?

Definitions of Environmental Education, Education for Sustainable Development, Climate Change Education, and Community Resilience Education

Educating for climate action and justice takes place in a variety of settings and is designed to meet the needs of diverse audiences. Educators identify with a variety of educational fields (e.g., environmental education, education for sustainable development). However, no matter the setting, audience, or field, the same overall goals of fostering civically engaged learners and creating a more equitable and sustainable future are shared.

- **Environmental Education (EE)**
  [EE] is a process that helps individuals, communities, and organizations learn more about the environment, develop skills to investigate their environment, and make intelligent informed decisions about how they can help take care of it. It has the power to transform lives and society. It informs and inspires. It motivates action. EE is a key tool in creating healthier and more civically engaged communities.

North American Association for Environmental Education (NAAEE). About EE and Why it Matters. n.d.
Retrieved from https://naaee.org/about-us/about-ee-and-why-it-matters

- **Education for Sustainable Development (ESD)**
  Education for sustainable development (ESD) gives learners of all ages the knowledge, skills, values and agency to address interconnected global challenges including climate change, loss of biodiversity, unsustainable use of resources, and inequality. It empowers learners of all ages to make informed decisions and take individual and collective action to change society and care for the planet. ESD is a lifelong learning process and an integral part of quality education. It enhances the cognitive, socio-emotional and behavioral dimensions of learning and encompasses learning content and outcomes, pedagogy and the learning environment itself.

UNESCO. *What is is Education for Sustainable Development?* May 2024.
Retreived from https://www.unesco.org/en/sustainable-development/education/need-know?hub=72522

- **Climate Change Education**
  Climate change education helps people understand and address the impacts of the climate crisis, empowering them with the knowledge, skills, values, and attitudes needed to act as agents of change.

UNESCO. Climate Change. Climate Change Education. n.d.
Retrieved from https://www.unesco.org/en/climate-change/education

- **Community Resilience Education**
  Educational approaches that develop community-level environmental literacy to understand threats and implement solutions that build resilience to extreme weather, climate change, and other environmental hazards. Environmental literacy here includes the knowledge, skills, and confidence to (1) reason about the ways that human and natural systems interact globally and locally, including the acknowledgment of disproportionately distributed vulnerabilities; (2) participate in civic processes; and (3) incorporate scientific information, cultural knowledge, and diverse community values when taking action to anticipate, prepare for, respond to, and recover from environmental hazards, including mitigating and adapting to climate change.

Bey, G., C. McDougall, & S. Schoedinger. *Report on the NOAA Office of Education Environmental Literacy Program Community Resilience Education Theory of Change*. National Oceanic and Atmospheric Administration, Washington, DC. 2020. Retrieved from https://www.noaa.gov/sites/default/files/legacy/document/2021/Feb/ELP_ToC_Report.pdf


Photo: Lars Plougmann / CC BY-SA 2.0

The Climate Crisis

Earth is warming at an unprecedented rate. Human activity is the principal cause.[1]

— NASA Global Climate Change

The more the planet warms, the greater the impacts. Without rapid and deep reductions in global greenhouse gas emissions from human activities, the risks of accelerating sea level rise, intensifying extreme weather, and other harmful climate impacts will continue to grow. Each additional increment of warming is expected to lead to more damage and greater economic losses compared to previous increments of warming, while the risk of catastrophic or unforeseen consequences also increases.

However, this also means that each increment of warming that the world avoids—through actions that cut emissions or remove carbon dioxide (CO_2) from the atmosphere—reduces the risks and harmful impacts of climate change. While there are still uncertainties about how the planet will react to rapid warming, the degree to which climate change will continue to worsen is largely in human hands.[2]

— Fifth National Climate Assessment, 2023

[1] NASA Global Climate Change. *Vital Signs of the Planet*, 2023. 2024. Retrieved from https://climate.nasa.gov/evidence/

[2] National Climate Assessment 5 (NCA5). November 2023. Retrieved from https://nca2023.globalchange.gov/

We experience a warming Earth in a variety of ways, including shifts in temperature, precipitation, and overall weather patterns that together create a changing global climate that impacts natural ecosystems and human communities everywhere. Although natural events such as volcanic eruptions or variations in the Sun's energy output can cause some incremental changes in the climate, the scientific evidence is clear that human activity is the principal cause of the rapid climate change we are experiencing.

Our consumption of fossil fuels is the largest contributor to global climate change.[3] We burn fossil fuels for energy to power our homes, cars, planes, tractors, and industries. Burning fossil fuels releases carbon dioxide (CO_2) and other gases (e.g., methane, nitrous oxide) that accumulate in the atmosphere. Although these gases occur naturally in small quantities, increasing their levels in the atmosphere acts like a heat-trapping blanket around the Earth.

> *Fossil fuels—coal, oil, and gas—are by far the largest contributor to global climate change, accounting for over 75 percent of global greenhouse gas emissions and nearly 90 percent of all carbon dioxide emissions.*
>
> *As greenhouse gas emissions blanket the Earth, they trap the sun's heat. This leads to global warming and climate change. The world is now warming faster than at any point in recorded history. Warmer temperatures over time are changing weather patterns and disrupting the usual balance of nature. This poses many risks to human beings and all other forms of life on Earth.*[4]

The global disruption caused by climate change is occurring at an unprecedented rate. Climate change can result in fundamental transformations of ecosystems and the displacement or loss of plants, animals, and other species. Longer, more intense droughts threaten wildlife and freshwater supplies and feed more intense wildfires. Temperature-sensitive fish and other marine life are changing migration patterns toward cooler and deeper waters to survive.

Climate change also impacts human health and well-being. According to the U.S. EPA, "climate change affects the food we eat, the air we breathe, the water we drink, and the places that provide us with shelter. Climate change can also impact people's health and well-being by altering the frequency or intensity of extreme weather events and spread of certain pests and diseases."[5] Longer wildfire seasons are reducing the Gross National Product (GNP) and damaging human health. And, although climate change may appear to have some potential benefits in some areas (e.g., longer growing seasons, changing ranges of some plants), the predominant impacts are negative: water- and food-related illnesses, forced displacement, workforce changes, increased hunger, poorer nutrition, worsening air quality, spread of infectious diseases, respiratory and heart diseases, extreme heat, and threats to water quality and quantity.

In the end, "future climate change impacts depend on choices made today."[6] Climate education can help people understand climate systems and build the skills and the collective will necessary to make the choices needed for change.

[3] United Nations. *Climate Action, Causes and Effects of Climate Change*. n.d. Retrieved from https://www.un.org/en/climatechange/science/causes-effects-climate-change

[4] Ibid

[5] Environmental Protection Agency. *Climate Change and Human Health*. 2023. Retrieved from https://www.epa.gov/climateimpacts/climate-change-and-human-health

[6] National Climate Assessment 5 (NCA5). November 2023. Retrieved from https://nca2023.globalchange.gov/

• See **Resource #1,** page 114, to learn more about great resources for climate change basics.
• See **Resource #2,** page 116, to learn more about climate change and human health.

DID YOU KNOW?

Definitions of Weather, Climate, Climate Change, and Global Warming

NOAA has provided an easy-to-understand explanation of some essential terms and relationships.

How is weather different from climate?
Weather and climate describe the same thing—the state of the atmosphere—but at different time scales.

Weather is what you experience when you step outside on any given day. In other words, it is the state of the atmosphere at a particular location over the short term. Climate is the average of the weather patterns in a location over a longer period of time, usually 30 years or more.

What is the difference between climate change and global warming?
Climate change refers to any significant change in the measure of climate for extended periods of time, usually over decades or longer. This includes major, long-term changes in temperature, precipitation, humidity, ocean heat, wind patterns, sea level, sea ice extent, and other factors, and how these changes affect life on Earth.

Global warming is one aspect of climate change. Specifically, it relates to the recent and ongoing rise in global average temperatures near Earth's surface (land, ocean, or both). Over the last 50 years, global warming has primarily been due to the increase of heat-trapping pollutants, called greenhouse gases, that humans are adding to the atmosphere primarily by burning fossil fuels.

Source: NOAA. *What's the difference between climate and weather?* March 9, 2016. https://www.noaa.gov/explainers/what-s-difference-between-climate-and-weather

GUIDELINES IN PRACTICE

Amplifying Youth Voices for Community Action

Flooding in an Urban Neighborhood

Students at St. Francis de Sales High School, a co-ed, college preparatory Catholic high school located in a diverse (48% Latino, 48% African American, and 4% white), traditionally working-class Chicago neighborhood, were alarmed by seasonal flooding. Initially focused on studying the flooding of Lake Michigan, the class shifted their attention to their community's flooding problem after realizing that a recent flood had left a member of their class homeless for a period.

This shift gave the students insight into the complexities of climate change and how it impacts their lives and the lives of their friends and family. The students delved into the issue and discovered that a local practice of routing house downspouts into the sewers caused local street flooding. The absence of city investment in stormwater infrastructure compounded the flooding problem. The students also came to understand the need for localized solutions and for community members to have a voice in those solutions.

Recognizing the significance of their findings, the students embarked on a mission to address the problem, collaborating closely with their local elected officials. The students launched a community education campaign, raising awareness about the detrimental effects of stormwater from house downspouts flowing into the community's sewer systems. Their advocacy extended to rewriting city policies aimed at discouraging harmful practices and promoting sustainable alternatives.

Through their unwavering dedication and relentless efforts, these students showcased the remarkable power of local action in addressing the multifaceted challenges posed by climate change. They made a tangible impact within their community and inspired others to join the movement toward a more resilient and sustainable future.

Centering Youth Experiences

This project was facilitated using the Earth Force approach to environmental civic action that centers on youth voices and their lived experiences. Through training, Earth Force equips adult facilitators to amplify the voices of young people in their communities. The shift is from teaching young people facts about the environment to listening to their experiences of the local environment and how it impacts their lives. By actively incorporating the experiences of youth in problem-finding, decision-making processes, and leadership roles, our approach honors the voices of young people who have been marginalized and ensures that their concerns and perspectives are heard and addressed.

Written by Vince Meldrum, Executive Director/CEO of Earth Force. For more information about Earth Force and Environmental Action Civics, visit https://earthforce.org/

Climate Solutions

> *IPCC and UNEP have both shown that a rapid shift from fossil fuels to renewables is possible. That restoring ecosystems to store carbon and buffer climate impacts is possible. That investing in nature-based solutions in cities and productive landscapes is possible, and profitable. That action on climate is also action on nature and biodiversity loss, and pollution and waste—the other two prongs of the triple planetary crisis.*[7]
>
> **— Inger Andersen, Executive Director, United Nations Environment Programme (UNEP)**

Feasible and affordable climate solutions exist now.[8] We have science- and technology-based solutions that can reduce greenhouse gas emissions and create carbon sinks. Indigenous Knowledge Systems offer solutions—adaptation strategies, biodiversity conservation, weather prediction, and land stewardship practices—developed over generations and deeply rooted in traditional practices, cultures, and interactions with the environment. Climate solutions are being implemented at every level—local, state/provincial, tribal, national, and global, and more are needed. With individual and collective action, we can respond to climate change in every community. We can mitigate climate change (i.e., reduce greenhouse gases), adapt to climate change (i.e., adjust to expected changes), and build climate-resilient communities.

From green infrastructure (e.g., green roofs, rain gardens, bioswales) and climate-resilient agricultural practices (e.g., planting drought-resistant crops) to ecosystem restoration and watershed management, climate solutions enhance the ability of communities to prevent, anticipate, prepare for, respond to, and recover from the adverse impacts of climate change. Embracing climate solutions and training a workforce with new skills to address climate change helps communities cope with the uncertainties and risks associated with rising temperatures, changing precipitation patterns, and more frequent and severe weather events. Climate education that focuses on solutions accelerates these changes: together, we can implement solutions and build the future we need.

[7] Speech Delivered by Inger Andersen, for 59th Session of the Intergovernmental Panel on Climate Change (IPCC-59), Nairobi, Kenya. July 25, 2023. Retrieved from https://www.unep.org/news-and-stories/speech/ipcc-solutions-climate-warming-world#:~:text=The%20IPCC%20and%20UNEP%20have,landscapes%20is%20possible%2C%20and%20profitable.

[8] Learn more about climate solutions from Project Drawdown, https://drawdown.org/

DID YOU KNOW?

Climate Mitigation, Climate Adaptation, and Climate Resilience

Responding to climate change involves reducing atmospheric greenhouse gases (mitigation) and adjusting to current and expected climate change impacts (adaptation) as well as community capacity building, which is part of community climate resilience.

- ***Mitigation*** *means making the impacts of climate change less severe by preventing or reducing the emission of greenhouse gases (GHG) into the atmosphere. Mitigation is achieved either by reducing the sources of these gases—e.g., by increasing the proportion of renewable energies or establishing a cleaner mobility system—or by enhancing the removal and storage of these gases—e.g., by increasing the size of forests. In short, mitigation is a human intervention that reduces the sources of GHG emissions and/or enhances the sinks.*[1]
- ***Adaptation*** *means anticipating the adverse effects of climate change and taking appropriate action to prevent or minimize the damage they can cause, or taking advantage of opportunities that may arise. Examples of adaptation measures include large-scale infrastructure changes, such as building defenses to protect against sea-level rise, as well as behavioral shifts, such as individuals reducing their food waste. In essence, adaptation is the process of adjusting to the current and future effects of climate change.*
- ***Resilience*** *to climate change is defined as the capacity to prepare for, respond to, and recover from the impacts of hazardous climatic events while incurring minimal damage to societal well-being, the economy, and the environment. This entails a range of actions across policy, infrastructure, services, planning, education, and communication. As such, building climate resilience requires a holistic and multi-dimensional approach to enhance communities' social, human, natural, physical, and financial capacities to cope with and recover from the impacts of climate change.*[2]

If you want to learn more about climate resilience, mitigation, and adaptation, here are additional resources worth exploring.

• Argonne National Laboratory. *Science 101: Climate Resilience*. Lamont, IL. n.d. Retrieved from https://www.anl.gov/science-101/climate-resilience
• European Environment Agency. *Climate Change Mitigation: Reducing Emissions*. Copenhagen, Denmark. 2023. Retrieved from https://www.eea.europa.eu/en/topics/in-depth/climate-change-mitigation-reducing-emissions
• Fang, C., J. Hench, C. Daniels, and A. Abrash Walton. *Centering Equity in Climate Resilience Planning and Action: A Practitioner's Guide*. NOAA Climate-Smart Communities Series, Vol. 3. Antioch University New England. Keene, NH. 2022. Retrieved from https://doi.org/10.25923/765q-zp33
• London School of Economics and Political Science. *What is the Difference Between Climate Change Adaptation and Resilience?* Grantham Research Institute. London, UK. 2022. Retrieved from https://www.lse.ac.uk/granthaminstitute/explainers/what-is-the-difference-between-climate-change-adaptation-and-resilience/
• Pathak, A., P. Glick, L.J. Hansen, L.E. Hilberg, J. Ritter, and B.A. Stein. *Incorporating Nature-Based Solutions in Community Climate Adaptation Planning*. NOAA Climate-Smart Communities Series, Vol. 5. National Wildlife Federation. Leesburg, VA. 2022. Retrieved from https://repository.library.noaa.gov/view/noaa/46632
• NASA, Global Climate Change, Vital Signs of the Planet. *Responding to Climate Change*. 2023. Retrieved from https://climate.nasa.gov/solutions/adaptation-mitigation/

[1] *European Environment Agency. What is the Difference Between Adaptation and Mitigation?* n.d. Retrieved from https://www.eea.europa.eu/help/faq/what-is-the-difference-between

[2] London School of Economics and Political Science. What is the Difference Between Climate Change Adaptation and Resilience? 2022. Retrieved from https://www.lse.ac.uk/granthaminstitute/explainers/what-is-the-difference-between-climate-change-adaptation-and-resilience/

continued on the following page

DID YOU KNOW?

Climate Mitigation, Climate Adaptation, and Climate Resilience

- Stone, E. *How Resilience Hubs Can Help Communities Face the Heat and the Climate Emergency*. LAist. 2023. Retrieved from https://laist.com/news/climate-environment/how-resilience-hubs-can-help-communities-face-the-heat-and-the-climate-emergency
- United Nations, Climate Action. *Climate Adaptation*. n.d. Retrieved from https://www.un.org/en/climatechange/climate-adaptation
- United Nations Climate Change. *Introduction to Mitigation*. n.d. Retrieved from https://unfccc.int/topics/introduction-to-mitigation
- U.S. Climate Resilience Toolkit. *Meet the Challenges of a Changing Climate*. United States Global Change Research Program, NOAA Climate Program Office. n.d. https://toolkit.climate.gov/
- WWF. *What's the Difference Between Climate Change Mitigation and Adaptation?* 2023. Retrieved from https://www.worldwildlife.org/stories/what-s-the-difference-between-climate-change-mitigation-and-adaptation

Photo: Dave Gardner Creative/National Forest

• See **Resource #3,** page 119, to learn more about climate change solutions.

GUIDELINES IN PRACTICE

Teens for Food Justice


Photo: Jessica DiMento / TFJ

Teens for Food Justice (TFFJ) believes in the power of youth to lead themselves and their communities to a food-secure future. TFFJ fights food insecurity, diet-related disease, and climate change through school-based, youth-led hydroponic farming. They provide local, sustainably-grown produce to food-insecure communities while building health equity for all New Yorkers and beyond. TFFJ works with Title I middle and high schools—schools in which at least 40% of students qualify for free or reduced-price lunch—located in neighborhoods with limited healthy food access. They train students to build and maintain indoor hydroponic farms, each capable of growing up to 10,000 pounds of produce annually. The produce is served daily at school lunch and distributed to nearby community residents. Further, students learn nutrition, health, and advocacy skills, empowering them to lead themselves and others toward healthier futures.

Schools are natural centers of community. Therefore, schools and their students are uniquely positioned to address community-level challenges, such as food and nutrition insecurity, physical and mental health disparities, and environmental racism. By taking a comprehensive approach to engaging students in school-based, youth-led urban agriculture, TFFJ's program honors and helps to activate the assets young people and schools bring to their community. Through inclusive community needs assessments and multi-stakeholder collaboration, TFFJ programs transform underutilized spaces in schools into sites of healthy food production. By nurturing a plant through its life cycle, students become agents in changing what they—and their peers—consume during school lunch. Through advocacy training and skill-building, students grow into food justice advocates addressing the community-level challenges that are experienced both within and beyond school walls.

Through their holistic approach, TFFJ supports students and schools as active and impactful members of their broader communities, equipped with the skills and resources to meet both immediate and structural community needs.

Written by Renae Cairns, Senior Program Manager, Teens for Food Justice, New York City

For more information about Teens for Food Justice:

- Teens for Food Justice, www.teensforfoodjustice.org
- Growing Community Leaders Through School-Based Hydroponic Agriculture (video), https://youtu.be/dpBIfICMNN8
- Brown, A. Cultivating Hope for the Future: How Hydroponic Farming and Urban Agriculture are Revolutionizing Food Deserts in a Changing Climate. November 2023. Retrieved from https://teensforfoodjustice.org/blog/hydroponic-farm-urban-agriculture/


Photo: State Farm / CC BY 2.0

Climate Justice

> *Climate change is happening now and to all of us. No country or community is immune. And, as is always the case, the poor and vulnerable are the first to suffer and the worst hit.*
>
> **— UN Secretary-General Antonio Guterres[9]**

Climate justice ensures that everyone, regardless of background, race and ethnicity, or location, enjoys equal opportunities to thrive in a sustainable and resilient world. Climate justice actively addresses the unequal impacts of climate change by prioritizing the health and safety of those who face the greatest risk, especially as communities prepare for and recover from climate events such as extreme heat and storms, wildfires and wildfire smoke, drought, and flooding.

Climate change impacts do not honor, respect, or acknowledge political boundaries. Climate change impacts are unevenly distributed across communities, regions, and the world—even within a single community, the consequences of climate change can differ among neighborhoods and individuals. For example, extreme weather and rising sea levels threaten those living on floodplains or near the coast. Long-standing socioeconomic inequities, including systematic racism, discrimination, and poverty, can increase the exposure of People of Color, low-wealth, LGBTQ+, and Indigenous communities to climate change impacts while also reducing their access to the resources needed to respond. Children, in part because they are still growing, are particularly vulnerable to air pollution, including smoke from wildfires. When evacuation is necessary, people with disabilities may have difficulty finding transportation or accommodations. People who are older and those who work outdoors, such as loggers, roofers, and agricultural workers, are exposed to excessive heat. During disasters, especially flooding, women are often vulnerable to greater danger if they are responsible for young children, and climate change has been linked to poor pregnancy outcomes.[10,11]

Climate change is not only an environmental issue; it is intertwined with poverty, inequality, social justice, affluence, unequal power structures, and economic forces. Addressing climate change requires exploring its root causes and transforming existing systems that perpetuate injustices. Climate education that centers on climate justice addresses how climate change affects all people, explores how climate solutions can be more equitable, and engages all people in developing climate change solutions.

[9] United Nations. *Climate Justice*. May 2019. Retrieved from https://www.un.org/sustainabledevelopment/blog/2019/05/climate-justice/

[10] EPA, Climate Change Impacts. *Climate Change and Human Health: Who's Most at Risk?* 2023. Retrieved from https://www.epa.gov/climateimpacts/climate-change-and-human-health-whos-most-risk

[11] EPA, Climate Change and Children's Health and Well-Being in the United States. Appendix A: Approach for Detailed Analyses. Retrieved from https://www.epa.gov/system/files/documents/2023-04/CLiME_Appendix%20A_Approach.pdf

DID YOU KNOW?

Selected Definitions of Climate Justice and Environmental Justice

Although climate change impacts every corner of Earth, not every person experiences these impacts similarly. As described by WeAct for Environmental Justice:

> *Climate change is the most critical and urgent issue facing our world, yet it is not just an issue of the "natural" environment. It has massive implications for social justice and human rights. Climate change will have an unequal impact on communities of color because it is a threat multiplier, meaning it will layer upon existing public health, economic, and racial injustices in the United States and around the world.*

Source: WeAct for Environmental Justice. *Climate Justice: The Climate Multiplier in Frontline Communities.* 2023. Retrieved from https://www.weact.org/whatwedo/areasofwork/climate/

With this in mind, we offer the following definitions of climate justice and environmental justice.

- **Climate Justice**

  Climate justice links human rights and development to achieve a human-centered approach, safeguarding the rights of the most vulnerable people and sharing the burdens and benefits of climate change and its impacts equitably and fairly. Climate justice is informed by science, responds to science, and acknowledges the need for equitable stewardship of the world's resources.

Source: Mary Robinson Foundation. Principles of Climate Justice. 2022. Retrieved from https://www.mrfcj.org/principles-of-climate-justice/

- **Climate Justice**

  Climate change threatens the health, livelihoods, and well-being of everyone, but it negatively affects specific groups more than others and often makes existing social and health inequities worse. Climate justice is focused on addressing the unequal impacts of climate change by prioritizing the health and safety of those who face the greatest risk as we prepare for and recover from climate events such as extreme heat and cold, wildfires and wildfire smoke, and flooding. The goals of climate justice are to make sure no one is left behind in the climate crisis and to transition to a healthier and more fair future for all living beings.

Source: Washington State Department of Health. *Climate Justice: What is Climate Justice and How Does It Relate to Health?* n.d. Retrieved from https://doh.wa.gov/community-and-environment/climate-and-health/climate-justice

- **Climate Justice**

  Climate Justice recognizes the disproportionate impacts of climate change on low-income communities and communities of color around the world, the people and places least responsible for the problem. It seeks solutions that address the root causes of climate change and, in doing so, simultaneously address a broad range of social, racial, and environmental injustices.

Source: University of California Center for Climate Justice. *What is Climate Justice?* 2022. Retrieved from https://centerclimatejustice.universityofcalifornia.edu/what-is-climate-justice/

- **Environmental Justice**

  *Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. This goal will be achieved when everyo*ne enjoys

  – *The same degree of protection from environmental and health hazards and*
  – *Equal access to the decision-making process to have a healthy environment in which to live, learn, and work.*

Source: Environmental Protection Agency. *Environmental Justice.* July 24, 2023. Retrieved from https://www.epa.gov/environmentaljustice

continued on the following page

DID YOU KNOW?

Selected Definitions of Climate Justice and Environmental Justice

- **Environmental Justice**
  *Environmental Justice is the **equitable treatment** and **meaningful involvement** of all people, regardless of race, color, national origin, ability, or income, and is critical to the development and application of laws, regulations, and policies that affect the environment, as well as the places people live, work, play, worship, and learn.*
  - ***Equitable treatment** means:*
    - *no group of people bears a disproportionate share of the negative consequences resulting from governmental, industrial, or commercial operations and policies*
    - *all people benefit from the application of laws and regulations*
    - *eliminating barriers such as poverty and lack of access, as well as repairing systemic injustices*
  - ***Meaningful involvement** means:*
    - *people have an opportunity to participate in decisions that affect their environment and/or health*
    - *decision-makers seek out and facilitate the involvement of those potentially affected*
    - *people's concerns are considered in decision-making processes*
    - *people can influence state agency decisions*

Source: Michigan Department of Environment, Great Lakes, and Energy. *Learn About Environmental Justice*. 2023. Retrieved from https://www.michigan.gov/egle/public/learn/environmental-justice

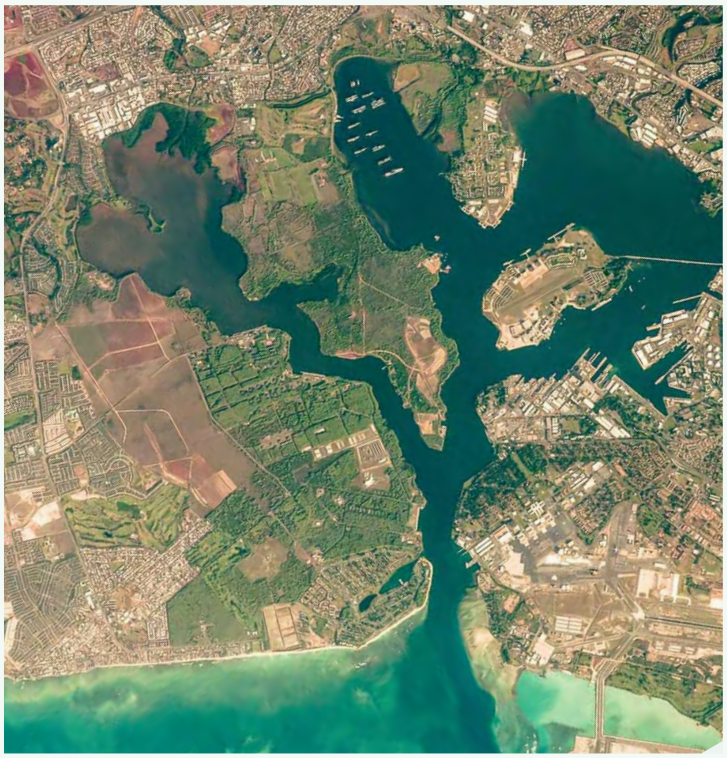
If you want to learn more about environmental justice and climate justice, here are some additional resources worth exploring.

- American Public Health Association (APHA). *Creating The Healthiest Nation: Environmental Justice for All*. n.d. Retrieved from https://www.apha.org/-/media/files/pdf/factsheets/environmental_justice.ashx?la=en&hash=BF2694E6A2FC6707C373F1E1DC60243BF333CACE#:~:text=Environmental%20justice%20protects%20the%20health,populations%20and%20communities%20of%20color.
- Arcaya, M. and E. Gribkoff. *Climate Justice. MIT*. March 14, 2022. Retrieved from https://climate.mit.edu/explainers/climate-justice
- Aspen Institute. 2023. *Environmental Justice Resources*. Retrieved from https://www.aspeninstitute.org/programs/energy-and-environment-program/environmental-justice-resources/
- Carman, J., et al. *Climate Change in the American Mind: Climate Justice*. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication. Spring 2023. Retrieved from https://climatecommunication.yale.edu/publications/climate-change-in-the-american-mind-climate-justice-spring-2023/
- Deep South Center for Environmental Justice. 2023. Retrieved from https://www.dscej.org/
- Environmental Protection Agency. *Learn About Environmental Justice*. 2023. Retrieved from https://www.epa.gov/environmentaljustice/learn-about-environmental-justice
- Environmental Protection Agency. *Identifying Communities with Environmental Justice (EJ) Concerns* (Video). 2023. Retrieved from https://www.youtube.com/watch?v=rQ5qqbBvfxw
- Johnson, A.E. and K.K. Wilkinson (eds.) *All We Can Save: Truth, Courage, and Solutions for the Climate Crisis.* 2020. New York: One World

- See **Resource #4,** page 120, to learn more about the principles of environmental justice and climate justice.
- See **Resource #5,** page 121, to learn more about who is at risk and why.

GUIDELINES IN PRACTICE

Honoring the Land



Mālama Pu'uloa is a nonprofit organization working on the Hawaiian island of O`ahu to restore Pu`uloa, the area known to nonnatives as Pearl Harbor. Most people know Pearl Harbor for the infamous attack that took place on December 7, 1941, launching United States engagement in World War II. Before Pearl Harbor was known as Battleship Row, it was a vibrant ecosystem that served the needs of many local Hawaiian families, plants, animals, economies, and ways of life. However, a changing climate, overuse from population increases, and growing tourism exposure have negatively altered the native ecosystem.

Today, Mālama Pu'uloa engages the community by hosting workdays, educating local youth through land-based programs, and creating a lei of partnerships to support collaborative goals. Mālama Pu'uloa is the primary program of a larger community stewardship networking organization called Hui o Ho`ohonua (HOH). Land restoration efforts were first catalyzed by a Coastal Resilience grant from the U.S. Fish and Wildlife Service to serve the Honouliuli Watershed. As this work expanded, HOH initiated the Pu`uloa Strategic Partnership to build collaboration that enhances the capacity of all participants to achieve land restoration and management goals.

The Hawaiian notion of "mālama" means to take care of, tend, attend, care for, preserve, and protect. This traditional ideal remains at the core of all project partners. To date, Mālama Pu'uloa has engaged over 20,000 community volunteers (including 40 K–college schools) to restore nearly 15 acres from invasive mangroves, re-establish traditional food systems, and create a growing network of community members united in purpose.

Mālama Pu'uloa is learner-centered and incorporates various science, storytelling, public education, native food and plant propagation, civic engagement, and adopt-a-plot campaigns. The project director, Sandy Ward (retired), comments, "My goal in this endeavor is to inspire other communities as empowered changemakers."

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GUIDELINES IN PRACTICE

Honoring the Land

This Mālama Pu'uloa community collaboration yields multiple connections to empowering climate action:

- **Native Plant Propagation for Honouliuli Watershed**
  Project collaborators: Hui o Ho`ohonua, Leeward Community College, State of Hawai'i Department of Land and Natural Resources, U.S. Fish and Wildlife Service
- **Citizen Science Projects**
  Project collaborators: Hui o Ho`ohonua and Leeward Community College
- **Shoreline Toxicity Research and Environmental Justice Mapping**
  Project collaborators: Hui o Ho`ohonua and University of Hawai'i Sea Grant College Program

Why Mālama Pu'uloa Works:
Mālama Pu'uloa project partners are working to restore tracks of land at the watershed level. This holistic, sustainable approach provides an innovative pathway to restoring the region to `āina momona—thriving land, thriving people.

- Part of the Mālama Pu'uloa mission addresses the perpetuation of historical trauma to the land, waters, and people of the local watershed. Understanding history is essential in planning for future success.
- Names matter.
  - *About the name Mālama Pu'uloa:*
    Mālama—to take care of, tend, attend, care for, preserve, protect Pu'uloa—Pearl Harbor
  - *About the name Hui o Ho`ohonua:*
    Hui—a group of people united for a purpose Ho`o Honua—making the Earth (that which sustains us) pono (setting things to right—as they should be)

HOH empowers and connects groups of all ages in the community to create positive change, seeking to cultivate a strong sense of stewardship, pride, and responsibility. Individuals, families, clubs, businesses, schools, and with a desire to Mālama Pu`uloa can help maintain and restore sites. Participants can choose the site, the size of their plot, and the times of their visits. Once adopted, the program asks that stewards visit at least twice a year to remove refuse and invasive plants from the site, supporting the adoption and growth of native plant species.

continued on the following page

GUIDELINES IN PRACTICE

Honoring the Land

Layers of interaction and engagement from Mālama Pu'uloa project partners. © Hui o Ho`ohonua

*Pono is a state of harmony and balance within individuals, communities, the environment, and the universe.

For more information about Mālama Pu'uloa:

- Mālama Pu'uloa Island Life Video (2 minutes): https://www.youtube.com/watch?v=ZHdg99T9TzQ
- ArcGIS StoryMap: The Pu'uloa Strategic Partnership: https://storymaps.arcgis.com/stories/0beb13c4c833420f87eeda3e65b2cdc5
- Pu'uloa Video (5 minutes): https://www.youtube.com/watch?v=1qPbbz5OulU
- Mālama Pu`uloa website: https://www.malamapuuloa.org/
- Sandy Ward's webinar (1 hour): https://youtu.be/rw9uiV0VtHg

RESOURCES YOU CAN USE

Jemez Principles for Democratic Organizing

Climate change education and action take place within a community, and working *with* that community is essential to a project's eventual success. The *Jemez Principles for Democratic Organizing* offer some guidance. These Principles were formulated in 1996 during a gathering of forty representatives from various social justice and environmental organizations in Jemez, New Mexico, to promote a more democratic, equitable, and inclusive approach to their work. These principles seek to create a framework that respects diversity, collaboration, and shared decision-making.

Six guiding principles were adopted by those gathered:

1. **Be Inclusive**
2. **Emphasis on Bottom-Up Organizing**
3. **Let People Speak for Themselves**
4. **Work Together in Solidarity and Mutuality**
5. **Build Just Relationships Among Ourselves**
6. **Commitment to Self-Transformation**

Source: Southwest Network for Environmental and Economic Justice (SNEEJ). *Jemez Principles for Democratic Organizing*. December 1996. Retrieved from https://www.ejnet.org/ej/jemez.pdf

Civic Engagement for Collective Action

> *Each of us can contribute, though. With our votes, our voices, our food choices, our skills, and our dollars. We must overhaul both corporate practices and government policies. We must transform culture. Building community around solutions is the most important thing. I am never going to give up working to protect and restore this magnificent planet. Every bit of habitat we preserve, every tenth of a degree of warming we prevent, really does matter.*
>
> **— Dr. Ayana Elizabeth Johnson**[12]

Climate solutions exist; they must be implemented. Immediate and sustained actions are needed. Individuals might make some of these changes in their personal lives, but that will not achieve all that is necessary. Transformative change requires collective actions at all levels, community, state/province, national, and international—groups of people working together towards the same goal—to accelerate emissions reduction, formulate and approve policies and regulations, implement adaptation strategies, and build resilient communities, including the creation of opportunities for meaningful jobs that contribute to a healthy planet.

Effective action contributes to the necessary efforts of implementing climate solutions and building a sustainable future. Actions might focus on building bike paths or improving the walkability of communities to reduce the emission of greenhouse gases into the atmosphere or constructing sea walls, dikes, or levees to respond to increased flooding. Actions might focus on planting trees to reduce air pollution, joining a community science effort to map urban heat islands, working to change energy efficiency standards in buildings, installing charging stations for electric vehicles, or creating a coalition to write a community climate resilience plan.

While individual action (e.g., turning off lights, reducing food waste, installing solar panels) is important and should be encouraged, climate change is a global issue. It impacts us all. Only collective action can lead to needed system changes that extend beyond each family. Collective actions can take place in a classroom, neighborhood, park or preserve, downtown business district, boardroom, or the halls of government. We need everyone—individuals, community groups, businesses, governments, and those for whom climate action is not a priority—working together across political, economic, and cultural boundaries to engage in meaningful action to face climate change.

Effective climate action depends on the capacity to identify and critique alternative solutions and courses of action, select and plan appropriate action-taking, and participate in climate action as an individual and in groups. Climate education plays an essential role in facilitating the development of these capacities.

[12] Ayana Elizabeth Johnson. *A Coral Reef Love Story*, TED Talk. April 2019. Retrieved from https://www.ted.com/talks/ayana_elizabeth_johnson_a_coral_reef_love_story

Individual and Collective Climate Action

The goal of climate change education is helping people develop the capacities and motivations necessary to make reasonable decisions and take action, both individually and collectively.

Individual climate action. Actions taken by individuals to address an issue or achieve a personal goal, such as reducing their carbon footprint and contributing toward mitigating climate change. Individuals can take these actions in various aspects of daily life, such as transportation (e.g., riding a bicycle or the bus), food choices (eating a plant-based diet or growing food), energy consumption (using less energy or conserving power), and waste management (recycling sources and reducing waste), and advocate for change (letter writing to corporations or the government). While individual actions are important in promoting environmental sustainability and other goals, they typically aren't enough to achieve large-scale change, even if everyone adopts them.

Educators can assist individuals to commit to taking these actions by increasing knowledge of the rationale for them and how to implement them, as well as concern about climate change. Practicing these actions in a supportive environment with the approval of important role models can also enable people to adopt new behaviors.

Collective climate action. Coordinated efforts of community members, organizations, agencies, or businesses to achieve a common goal or address a shared concern. The group may pool resources, knowledge, and skills to achieve a shared outcome that may not be possible for any individual to achieve on their own.

Collective climate action can involve activities such as creating awareness campaigns, promoting regulations that reduce greenhouse gas emissions from public buildings and infrastructure, working with government officials to implement policies that increase climate resilience, installing solar panels on a church roof, and ensuring climate justice. It can also involve developing community art projects, protecting natural ecosystems, adopting renewable energy sources, implementing sustainable transportation initiatives, creating community gardens, promoting workforce development, and promoting climate change education.

continued on the following page

DID YOU KNOW?

Individual and Collective Climate Action

Educators can assist individuals to work collectively on climate actions by building the skills and knowledge needed to work together, as well as the commitment and motivation to do so. Communication, problem solving, and systems thinking skills are extremely useful, in addition to leadership and team skills and a vision of what can be possible when people work together.

Collective action has the potential to bring about systemic change by leveraging the power of combined resources and group coordination and targeting community-level issues. In contrast, individual action tends to focus more on personal behavior change. Ultimately, both collective and individual action are important and complementary approaches to addressing climate change.

If you want to learn more about individual and collective climate action, there are many excellent resources worth exploring.

- Avit K Bhowmik et al. *Powers of 10: Seeking "Sweet Spots" for Rapid Climate and Sustainability Actions Between Individual and Global Scales.* Environmental Research Letters. 2020. 15. Retrieved from https://iopscience.iop.org/article/10.1088/1748-9326/ab9ed0
- Johnson, A. *Climate Action Venn Diagrams. How You—Specifically You—Can Help with Climate Solutions*. n.d. Retrieved from https://www.ayanaelizabeth.com/climatevenn
- Fischmann, D. & C. Chissell. *The Powerful Role of Household Actions in Solving Climate Change.* Project Drawdown. 2021. Retrieved from https://drawdown.org/news/insights/the-powerful-role-of-household-actions-in-solving-climate-change
- Kristoffersen, M. *Collective Action Helps Young Adults Deal with Climate Change Anxiety.* Yale School of Public Health. 2022. Retrieved from https://ysph.yale.edu/news-article/collective-action-helps-young-adults-deal-with-climate-change-anxiety/
- Penn State College of Earth and Mineral Sciences. *GEOG 30N Environment and Society in a Changing World. Individual vs. Collective Action.* 2023. Retrieved from https://www.e-education.psu.edu/geog30/node/346
- Project Drawdown. *The Drawdown Roadmap: Using Science to Guide Climate Action.* 2023. Retrieved from https://drawdown.org/drawdown-roadmap
- The Climate Reality Project. *Individual Action vs Collective Action and the Importance of the Swiss Cheese Model*. 2021. Retrieved from https://www.climaterealityproject.org/blog/individual-action-vs-collective-action-and-importance-swiss-cheese-model


Photo: Santa Monica Mountains National Recreation Area

Who should use this set of guidelines? Where should they be used?

We have written this set of guidelines to serve a broad range of educators, organizations, and agencies interested in using education as a tool for addressing climate change. By educator, we mean those who have traditionally served in this role, such as early childhood educators, elementary and secondary school teachers, museum and zoo educators, community educators, university faculty, and career and technical education teachers, as well as those who work with learners in other roles, such as volunteers and docents, youth leaders, weather broadcasters, leaders of civic clubs, community organizers, faith leaders, and government agency staff and policy-makers. People in all these roles facilitate learning opportunities and provide formal and informal opportunities that foster the development of the capacities needed for effective climate justice and action. Educators are also co-learners throughout the process.

Educational activities may take place in schools, museums, aquariums, nature centers, religious organizations, workplaces, community centers, and other community gatherings, including virtual ones. Participants in these educational activities might be preK–12 students, university students, members of youth or civic groups, workers, neighbors, NGO staff, business employees, policymakers, or government agency staff. Because of this diversity, we will refer to those engaged in educational activities as learners rather than students.

To promote clarity, when community members participate in educational activities, they are learners. When learners interact with others in the community who are not part of their group of learners, we will refer to these others as community members.

How were these guidelines developed?

These guidelines draw on educational practices honed by scholars and practitioners in diverse fields including education, climate justice, environmental justice, social change, community development, science, policy, and communication. To ensure that these Guidelines for Excellence reflect a widely shared understanding of climate education and climate justice, background research was conducted, and thought leaders in climate education, environmental justice, and climate justice were interviewed.

A team of climate education and climate justice professionals from various backgrounds and organizational affiliations wrote the guidelines. This team took on the challenge of turning ideas about quality into tangible recommendations and examples. In addition, drafts of these guidelines were circulated widely to practitioners and scholars from across North America and around the world. We incorporated their comments into successive revisions of the document. Over 800 scholars and practitioners have participated in the writing of these guidelines. This document reflects our collective wisdom.

• See **Resource #6,** page 124, to learn more about climate change research and policy reports.

How are the guidelines organized?

These guidelines are organized around five **Key Characteristics** that provide a high-level framework for excellent, meaningful climate education focused on climate action and climate justice. Under each Key Characteristic, we have included **Guidelines** that describe how that Key Characteristic could be implemented. Each Guideline is accompanied by several **Indicators** that illustrate action that can address the guideline. These are meant as suggestions; educators will need to adapt them to ensure they are appropriate for their learners and communities.

In addition, we have included case studies that illustrate the **Guidelines in Practice**. The guidelines are also accompanied by resource and informational boxes—titled **RESOURCES YOU CAN USE!** and **DID YOU KNOW?**—that include definitions, explanation, references, links to websites, and more.

How to use the guidelines

Educating for Climate Action and Justice: Guidelines for Excellence provides direction while allowing flexibility in shaping content, techniques, and other aspects of program design and delivery. These guidelines offer a decision-making tool for addressing the needs of your learners, thinking about curriculum and scaffolding, working with partners, and engaging community members. They offer a set of ideas about what an effective climate education program centered on climate action and justice could be.

It is unreasonable to expect that every climate education program will follow all the guidelines; contexts vary, and educators design opportunities that meet the needs of their learners. Specific indicators for one or more guidelines may not apply to a particular educational effort. Users of these guidelines need to determine which key characteristics, guidelines, and indicators apply to their situation.

Of course, no guidelines could contain every possible detail of what constitutes a quality climate education program. *Educating for Climate Action and Justice: Guidelines for Excellence* provides a foundation on which to build programs that move toward this goal. As a tool to inform decision-making, these guidelines can contribute to more effective climate education that centers on climate action and justice. The Key Characteristics outline ways of creating an effective learning environment, laying the foundation for both the knowledge and skills as well as the emotional support necessary for learning and action, and charting the action-taking process from understanding the community and building partnerships to designing and implementing an action plan.

Guidelines Summary

Key Characteristic #1
Collaborative, Welcoming, and Responsive Learning Environments

- Ensure an inclusive learning environment
- Engage learners in open inquiry
- Explore worldviews and perspectives
- Examine climate change information and misinformation

Key Characteristic #2
Knowledge and Skills to Foster Climate Action

- Build awareness and appreciation
- Understand climate processes and systems
- Understand human systems related to climate change
- Apply systems thinking
- Develop action strategies and skills
- Build personal and civic responsibility

Key Characteristic #3
Attention on Climate Emotions

- Recognize and acknowledge climate emotions
- Cultivate constructive hope
- Develop self-efficacy and agency

Key Characteristic #4
Locally Focused and Community Driven

- Know the community
- Identify key individuals, organizations, and communities of interest
- Build partnerships and collaborative relationships
- Collect community concerns about climate actions

Key Characteristic #5
Civic Engagement for Climate Action

- Investigate community-centered climate concerns
- Select a civic action goal and plan a strategy for achieving it
- Take action on selected climate issue(s) and concern(s)
- Celebrate and share progress toward a thriving community

Essential Underpinnings of Environmental Education



Environmental education builds from core principles that inform its approach to learning:

Human Well-Being: Human well-being is inextricably bound with environmental quality. Humans are a part of the natural order. Humans, and the systems they create—societies, political systems, economies, religions, cultures, technologies—impact the total environment and are impacted by the environment. Since humans are a part of nature rather than outside it, they are challenged to recognize the ramifications of their interdependence with Earth systems.

Importance of Where One Lives: Beginning close to home, learners connect with, explore, and understand their immediate surroundings. They appreciate the nature around them wherever they live. The sensitivity, knowledge, and skills needed for this local connection to both the natural and built environments provide a base for moving into larger systems, broader issues, and an expanding understanding of connections and consequences.

Integration and Infusion: Disciplines from the natural sciences, social sciences, and the humanities are interconnected through the environment and environmental issues. Environmental education offers opportunities to integrate disciplinary learning, fostering a deeper understanding of concepts and skills. EE works best when infused across the curriculum rather than treated as a separate or isolated experience.

Justice, Equity, Diversity, and Inclusion: Environmental education instruction is welcoming and respectful to all learners and embraces the principles of fairness and justice. EE is designed to employ and engage people with different backgrounds, experiences, abilities, and perspectives through culturally relevant and responsive instruction. EE actively works to create equitable learning opportunities and promotes the dignity and worth of people of all races, ethnicities, religions, genders, sexual orientations, gender identities, abilities, incomes, language groups, marital statuses, ages, geographic locations, and philosophies.

Lifelong Learning: Critical and creative thinking, decision making, communication, and collaborative learning, are emphasized. Development and ongoing use of a broad range of skills and practices are essential for active and meaningful learning, both in school and over a lifetime.

Roots in the Real World: Learners develop knowledge and skills through direct experience with their community, the environment, current environmental issues, and society. Investigation, analysis, and problem solving are essential activities and are most effective when relevant to learners' lives and rooted in their experiences.

Sustainable Future: Embracing the United Nations Sustainable Development Goals and the Greening Education Partnership, learning reflects on the past, examines the present, and is oriented to the future. Learning focuses on environmental, social, and economic responsibility as drivers of individual, collective, and institutional choices.

Systems and Systems Thinking: Systems thinking helps make sense of a large and complex world. A system is made up of parts. Each part can be understood separately. The whole, however, is understood only by examining the relationships and interactions among the parts. Earth is a complex system of interacting physical, chemical, and biological processes. Organizations, individual cells, communities of animals and plants, and families can all be understood as systems. And systems can be nested within other systems.

A Word About Learner Expectations—Educating Across Ages and Levels of Experience

This set of guidelines is designed for use in a wide variety of settings with an array of different types of learners—young children attending a preschool, youth enrolled in an afterschool program, high school students in a civics class, neighbors working on localized flooding, or a multigenerational committee focused on writing a climate resilience plan. Consequently, we have articulated a set of high-level capacities that can guide educators as they develop appropriate educational experiences for their learners. As young children grow into adulthood, learning opportunities are provided, and knowledge and skills are taught and reinforced at increasingly higher levels of complexity. The nature of the educational experiences will depend on the learner's characteristics and past experiences, whether that learner is a young child, a youth, or an adult.

As you take the guidelines and indicators offered here and translate them to meet the needs of your group of learners, you may find the following resources helpful:

- Chiariello, E., et al. Social Justice Standards: *The Learning for Justice Anti-Bias Framework. Learning for Justice.* 2018. Retrieved from https://www.learningforjustice.org/frameworks/social-justice-standards
- Inner Development Goals. *Transformational Skills for Sustainable Development.* IDG Foundation. 2023. Retrieved from https://www.innerdevelopmentgoals.org/
- Learning in Places. Storyline Frameworks for Educators. Learning in Places Collaborative. 2023. Retrieved from http://learninginplaces.org/storyline-frameworks/
- National Council for the Social Studies (NCSS). *College, Career & Civic Life: C3 Framework for Social Studies State Standards.* 2013. Retrieved from https://www.socialstudies.org/system/files/2022/c3-framework-for-social-studies-rev0617.2.pdf
- Next Generation Science Standards. *Appendix E—Progressions Within the Next Generation Science Standards.* 2013. Retrieved from https://www.nextgenscience.org/sites/default/files/resource/files/AppendixE-ProgressionswithinNGSS-061617.pdf
- Maine Department of Education. *MOOSE Climate Learning Progression.* 2023. Retrieved from https://www.maine.gov/doe/moose/lp/climate
- Simmons, B. et al. *K–12 Environmental Education: Guidelines for Excellence.* NAAEE. 2019. Retrieved from https://eepro.naaee.org/sites/default/files/eepro-post-files/k-12_ee_guidelines_for_excellence_2019_2.pdf
- Simmons, B. et al. E*arly Childhood Environmental Education Programs: Guidelines for Excellence.* NAAEE. 2016. Retrieved from https://eepro.naaee.org/sites/default/files/eepro-post-files/early_childhood_ee_guidelines.pdf
- State of New Jersey, Department of Education. Climate Change Education: *New Jersey Student Standards.* 2020. Retrieved from https://www.nj.gov/education/standards/climate/learning/gradeband/index.shtml
- UNESCO. Greening Education Partnership. *Green Curriculum Guidelines: Teaching and Learning for Climate Action.* 2024. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000390022/PDF/390022eng.pdf.multi
- U.S. Global Change Research Program, Climate Engagement and Capacity Building Interagency Group (CEG-IG). *Climate Literacy Guide.* n.d. Retrieved from https://www.climate.gov/teaching/climate
- Washington State. *K–12 Integrated Environmental and Sustainability Learning Standards.* 2014. Retrieved from https://ospi.k12.wa.us/sites/default/files/2023-08/esestandards.pdf
- White, P., et al. A*gency in the Anthropocene: Supporting Document to the PISA 2025 Science Framework.* OECD Education Working Papers No. 297. 2023. https://doi.org/10.1787/8d3b6cfa-en
- YouthPower2. *Positive Youth Development (PYD) Framework.* YouthPower.org. n.d. Retrieved from https://www.youthpower.org/positive-youth-development-pyd-framework

• See **Resource #6,** page 125, for more case studies supporting climate action and justice.

Key Characteristic #1

Collaborative, Welcoming, and Responsive Learning Environments

Photo: Lachlan Gardiner / Climate Visuals


Photo: Preston Keres/USDA/FPAC

Key Characteristic #1

Collaborative, Welcoming, and Responsive Learning Environments

Effective climate educators create culturally responsive, and welcoming learning environments that are inclusive of the whole learning community. Educators maximize active learning about climate change, climate action, and climate justice. They facilitate the investigation of climate impacts, analysis of climate justice concerns, and exploration of possible climate solutions and actions in a manner appropriate for their learners, their context, and their community. Educators provide opportunities for climate action-taking of the learners' choosing. As appropriate, educational experiences are co-designed with partners.

A. Ensure an inclusive learning environment

Educators collaboratively foster a learning environment, including interaction among learners, that is safe, engaging, culturally relevant and responsive, developmentally appropriate, accessible, supportive of relationship-building, intellectually stimulating, and motivating.

Indicators:

- Adjust climate education practices to meet the needs of different ages, audiences, and communities.
- Display enthusiasm, respect, care, fairness, and warmth, and support the learners' social, emotional, and physical needs as they investigate climate systems, climate change, climate justice, and climate solutions.
- Explore local climate change impacts and climate justice concerns to ensure educational experiences are personally relevant and meaningful to learners.
- Consider implications for climate justice in investigations of community history, conditions, issues, and decisions.
- Demonstrate concern and offer alternatives for the learners' physical and emotional safety, especially during climate education experiences that are hands-on, take place outside, are in unfamiliar settings, or relate to controversial issues and strongly held beliefs.
- Demonstrate flexibility and modify plans and approaches to take advantage of unexpected opportunities, including learner questions about climate systems, climate impacts, climate solutions, and climate justice.
- Respond to learners' interests and ways of knowing and adjust to meet their needs.
- Offer sources of information that are relevant, accessible, timely, and represent learners' identities and cultural backgrounds. Consider sources of information that extend learners' understanding of other cultures.
- Provide multiple points of access to engagement, reaching learners where they are comfortable. For example, incorporate family and community knowledge by inviting guest speakers or employing activities using family interviews, storytelling, and community research.

DID YOU KNOW?

Some Useful Definitions: Culturally Relevant Teaching, Culturally Responsive Teaching, and Culturally Sustaining Teaching

- **Culturally Relevant Teaching**
  Proposed by Gloria Ladson-Billings , Culturally Relevant Pedagogy is an asset-based approach that engages learners by connecting to their experiences, cultural backgrounds, and interests throughout instruction. According to the California Department of Education (2020):

  > *Culturally Relevant Pedagogy is a theoretical model that focuses on multiple aspects of student achievement and supports students to uphold their cultural identities. Culturally Relevant Pedagogy also calls for students to develop critical perspectives that challenge societal inequalities.*
  >
  > *Gloria Ladson-Billings proposed three main components of Culturally Relevant Pedagogy: (a) a focus on student learning and academic success, (b) developing students' cultural competence to assist students in developing positive ethnic and social identities, and (c) supporting students' critical consciousness or their ability to recognize and critique societal inequalities. All three components need to be utilized.*

  Source: California Department of Education. *Culturally Relevant Pedagogy*. 2020. Retrieved from https://www.cde.ca.gov/pd/ee/culturalrelevantpedagogy.asp

- **Culturally Responsive Teaching**
  [Culturally responsive teaching is] *the behavioral expressions of knowledge, beliefs, and values that recognize the importance of racial and cultural diversity in learning. It is contingent on . . . seeing cultural differences as assets; creating caring learning communities where culturally different individuals and heritages are valued; using cultural knowledge of ethnically diverse cultures, families, and communities to guide curriculum development, classroom climates, instructional strategies, and relationships with students; challenging racial and cultural stereotypes, prejudices, racism, and other forms of intolerance, injustice, and oppression; being change agents for social justice and academic equity; mediating power imbalances in classrooms based on race, culture, ethnicity, and class; and accepting cultural responsiveness as endemic to educational effectiveness in all areas of learning for students from all ethnic groups.*

  Source: Geneva, G. *Culturally Responsive Teaching: Theory, Research, and Practice.* 2010. New York: Teachers College.

- **Culturally Sustaining Teaching**
  Culturally sustaining practices (CSP) allow, invite, and encourage students to not only use their cultural practices from home in school, but to maintain them. CSP allows students to exist not only in the culture of their school, but also in the culture of their home.

  Source: Chajed, A. *Culturally Sustaining Pedagogy: An introduction.* 2020. Retrieved from https://cpet.tc.columbia.edu/news-press/culturally-sustaining-pedagogy-an-introduction

If you want to learn more about culturally responsive teaching, here are some resources worth exploring.

- Howard, T. *Seven Culturally Responsive Teaching Strategies and Instructional Practices.* 2021. Retrieved from https://www.hmhco.com/blog/culturally-responsive-teaching-strategies-instruction-practices
- Re-imagining Migration. *Culturally Responsive Teaching Checklist.* UCLA. 2019. Retrieved from https://reimaginingmigration.org/wp-content/uploads/2019/01/Culturally-Responsive-Teaching-Checklist_Re-Imagining-Migration.pdf
- Sci Girls. *Culturally Responsive Teaching.* 2019. Retrieved from https://www.youtube.com/watch?v=Y22JGwU1Upc&feature=youtu.be
- Will, M. and Najarro, I. *What Is Culturally Responsive Teaching?* Education Week. April 18, 2022. Retrieved from https://www.edweek.org/teaching-learning/culturally-responsive-teaching-culturally-responsive-pedagogy/2022/04#:~:text=culturally%20responsive%20teaching%3A%20a%20pedagogy,as%20belonging%20in%20academic%20spaces.

Some Useful Definitions: Accessibility, Diversity, Equity, and Inclusion

- **Accessibility**
  …when a person with a disability is afforded the opportunity to acquire the same information, engage in the same interactions, and enjoy the same services as a person without a disability in an equally integrated and equally effective manner, with substantially equivalent ease of use.

Source: Curry, C. *Understanding the Definition of Accessibility.* American Consortium for Equity in Education. 2023. Retrieved from https://www.ace-ed.org/understanding-the-definition-of-accessibility/

- **Diversity**
  Diversity is the recognition, acceptance, and affirmation of our individual differences, identities, and our inherent dignity. It is more than representation.

Source: Ford Foundation. *Our Values.* 2023. Retrieved from https://www.fordfoundation.org/diversity-equity-and-inclusion/

- **Equity**
  The guarantee of fair treatment, access, opportunity, and advancement while at the same time striving to identify and eliminate barriers that have prevented the full participation of some groups. The principle of equity acknowledges that there are historically underserved and underrepresented populations and that fairness regarding these unbalanced conditions is needed to assist equality in the provision of effective opportunities to all groups.

Source: USCAN. Climate Action Network. *Justice, Equity, and Inclusion.* 2020. Retrieved from https://www.usclimatenetwork.org/justice_equity_diversity_and_inclusion

- **Inclusion**
  The act of creating environments in which any individual or group can be and feel welcomed, respected, supported, and valued to fully participate and bring their full, authentic selves to work. An inclusive and welcoming climate embraces differences and offers respect in the words/actions/thoughts of all people.

Source: USCAN. Climate Action Network. *Justice, Equity, and Inclusion.* 2020. Retrieved from https://www.usclimatenetwork.org/justice_equity_diversity_and_inclusion

If you would like to learn more, consider exploring NAAEE's Justice, Equity, Diversity, and Inclusion Resources for Environmental Education Professionals and Students website.

This site includes a list of resources, including resources developed by NAAEE, designed to help educators and learners of all ages center equity in their work in the field of environmental education. NAAEE encourages you to take part in the Equity and Inclusion discussion forum in eePRO (eepro.org) and comment on the resources that are most helpful to you.

Access the site at: https://naaee.org/about/justice-equity-diversity-and-inclusion

GUIDELINES IN PRACTICE

Integrating Scientific Research with Traditional Ecological Knowledge to Motivate Climate Change Action

In the early 2000s, along the shores of Lake Superior, extreme storm events were on the rise. Fluctuating water levels caused problems with docks that provide lake access, affecting public safety. Fewer days of frozen roads meant fewer days winter loggers could work in the woods, affecting family incomes. In the heart of the Lake Superior Ojibwe Indian Country, tribal members saw changes affecting their treaty rights to hunt, fish, and gather, including declines in the wild rice harvest, a staple food and cultural anchor for these native communities.

Climate change could help explain all of these phenomena, as well as others that people might notice in their daily lives. But how do you pick apart whether these are enduring changes caused by a changing climate or whether shorter-term fluctuations in the weather might be the cause? How do you help people connect the impacts they are seeing in their cultures and communities to the larger issue of climate change in a way that builds knowledge and compels action?

One way, says Cathy Techtmann, outreach specialist with University of Wisconsin–Extension, is to blend place-based, Indigenous ways of knowing with ecological science. Traditional Ecological Knowledge and language reflect the generations-old relationship of Indigenous people with the environment, especially through cultural practices such as wild rice harvesting. This long-term knowledge provides a baseline for evaluating whether the environmental changes we observe in our cultures may be caused by climate change or reflect short-term weather variability. "If both culture and science agree that climate change is real, and if people can see that it's affecting something they care about culturally or economically like wild rice or fishing or winter logging or gardening," Techtmann notes, "they're more likely to care enough to learn and take action."

A group of partners turned the marriage of Ojibwe Traditional Ecological Knowledge and ecological science into a climate literacy model and associated curriculum called Gikinoo'wizhiwe Onji Waabaan, or G-WOW for short. In Ojibwe, this means "Guiding for Tomorrow," a name given by an Ojibwe elder and project contributor. The partners—University of Wisconsin–Extension, Great Lakes Indian Fish and Wildlife Commission (GLIFWC), Chequamegon-Nicolet National Forest–U.S. Fish and Wildlife Service and U.S. Forest Service, and Apostle Islands National Lakeshore–National Park Service—are supported by a growing list of funders and local collaborators. GLIFWC represents the off-reservation treaty rights of 11 Ojibwe tribes in Michigan, Minnesota, and Wisconsin, providing a link to traditional knowledge, tribal elders, and research such as the Commission's "Integrating Scientific and Traditional Ecological Knowledge" climate vulnerability study.[1]

[1] Great Lakes Indian Fish and Wildlife Commission, https://glifwc.org

continued on the following page

GUIDELINES IN PRACTICE

Integrating Scientific Research with Traditional Ecological Knowledge to Motivate Climate Change Action

G-WOW's learning model hinges on revealing how climate change is affecting the sustainability of species and habitats that support cultural and economic activities people value. By developing and evaluating hypotheses, learners (middle school through adult) explore whether changes affecting a cultural or economic activity they value and the environment that supports it are connected to climate change. The long-term Ojibwe perspectives on environmental change are integrated with climate science research and projections of climatic variables such as temperature.

Learners may explore activities similar to those practiced by the Ojibwe people, such as winter logging. The Ojibwe know that winters are warming based on long-term observations of species requiring cold weather. When learners connect those observations with scientific projections of fewer nights below freezing and their own observations of a shortening winter logging season, they can evaluate how climate change is affecting this economically important practice in the Great Lakes region. By revealing how climate change is affecting cultural and economic activities people value, G-WOW encourages service-learning projects that grow out of exploring these connections.

Beyond a lived cultural experience and Traditional Ecological Knowledge, tribal collaborators from several Lake Superior Ojibwe communities shaped the initiative in other ways. For example, the curriculum has spawned a climate leadership institute[2] that, like G-WOW itself, integrates Ojibwe and Western leadership practices to promote climate resilience within the Lake Superior region.

The G-WOW model can work in many cultures and locations to help learners make concrete connections between cultural practices, key species and habitats, and place-based and scientific evidence of climate change effects. Indigenous ecological knowledge from other cultures or long-term local knowledge can also provide a baseline for building climate awareness and action.

G-WOW resources infuse Traditional Ecological Knowledge, Ojibwe language, and cultural perspectives and include:

- An interactive website and curriculum with four seasonal lifeway units, activity guides, and examples for climate action to help learners develop climate change hypotheses and create service learning activities
- An interactive exhibit at the Northern Great Lakes Visitor Center in Ashland, Wisconsin
- Youth climate change programs
- Professional development programs for formal and nonformal educators to build confidence and leadership in using the G-WOW model to educate about climate change

For more information, visit: G-WOW, www.g-wow.org

[2] UW Extension G-WOW Climate Literacy and Leadership Programs, https://fyi.extension.wisc.edu/nglvc/cool-coasts/

B. Engage learners in open inquiry

Educators design and implement experiences that are learner-centered and learner-directed. Educators respond to learners' interests and ways of knowing. Educators provide opportunities for learners to investigate the causes, impacts, and possible solutions for climate change and climate justice concerns of their own choosing.

Indicators:

- Provide opportunities for authentic, hands-on exploration of climate systems, climate concerns, climate justice, and possible climate solutions. For example, provide opportunities for learners to collect, analyze, and evaluate their own data and draw conclusions.
- Facilitate sensemaking, focusing on building personal and community climate connections, including with people from communities with climate justice concerns.
- Support and encourage learner voices, including youth voices and the voices of people from communities with climate justice concerns.
- Offer ways for learners to make choices about the educational process, express themselves, provide leadership, collaborate, share their knowledge, take responsibility for their own learning, and reflect on their experiences.
- Provide opportunities for culturally relevant and responsive open inquiry and investigation, especially when considering controversial climate concerns that require learners to reflect on their own and others' perspectives.
- Ensure equitable opportunities for leadership to develop among learners and for leaders, including youth and individuals from communities with climate justice concerns, to step forward and grow.
- Provide learning opportunities focused on identifying and addressing power imbalances, especially among decision-makers, learners, and community members.

• See **Resource #7,** page 126, to learn more about the elements of effective climate education.
• See **Resource #8,** page 128, to learn more about developmentally appropriate practice.
• See **Resource #9,** page 130, to learn more about the features of positive youth development.

Learner-Centered Instruction

Learner-centered or learner-directed instruction places the learners' needs, interests, and abilities at the center of the learning experience. Learners take an active role in setting their learning goals, identifying resources and strategies for achieving them, and assessing their progress. It emphasizes active learning, critical thinking, and problem-solving skills.

In learner-centered instruction, the educator takes on the role of facilitator or guide rather than an authoritative figure. The educator creates a supportive learning environment and provides opportunities for learners to explore and discover knowledge through their efforts.

Learner-centered instruction is based on the idea that learners are more motivated and engaged when they have a sense of ownership and control over their learning. It allows learners to pursue their interests and goals in a way that is personally meaningful to them and encourages them to take responsibility for their learning.

Here are some key features of learner-centered instruction.

- **Active participation**: Learners are encouraged to actively participate in the learning process, to ask questions, and to engage in discussions and debates.
- **Collaboration**: Often involving group work, learners work together, share their knowledge and ideas, solve problems, and complete tasks.
- **Real-world relevance**: Learner-centered instruction emphasizes the importance of connecting learning to the real world, which can be achieved by using real-world examples and projects.
- **Individualized learning**: Each student's needs and abilities are taken into account, and instruction is tailored to meet their unique needs.
- **Self-directed learning or learner choice**: Learners are given the freedom and responsibility to direct their learning, with the educator serving as a guide. Learners make choices about what they learn, how they learn, and how they demonstrate their learning.
- **Assessment, reflection, and self-evaluation**: Learners reflect on their learning and identify areas for improvement. Educators use assessment primarily to support learning rather than to measure it, providing feedback to learners on their progress and helping them identify areas where they need further development.
- **Supportive environment**: Learner-centered instruction requires a supportive environment where learners feel comfortable taking risks and making mistakes. Educators play an important role by providing encouragement and positive feedback.

GUIDELINES IN PRACTICE

A (Climate Justice) League of Their Own

The Climate Justice League in Washington State is a is a cohort-based professional learning experience that supports K–12 teachers in designing and facilitating science teaching that highlights social and environmental justice connections. The student learning experiences they design focus on local climate challenges, ultimately resulting in meaningful actions. These local climate justice phenomena also connect with complex regional, national, and global climate effects, enabling teachers and students to practice systems thinking in their investigations. Community collaborators co-lead professional development sessions, amplifying the expert voices of those already ingrained in climate justice work.

The Climate Justice League professional development model is a yearlong cohort that includes both in-person workshops and meetings over Zoom. Three regional cohorts of the Climate Justice League meet across Washington State, creating opportunities for localized learning and collaborations with regional experts and climate justice leaders. Climate Justice League participants learn about local climate justice issues and plan ways to bring this learning into their classrooms. Participants develop a Community Action Plan where teachers support their students in taking action on an issue impacting their community. After implementing lessons and activities in their classrooms, participating teachers share experiences and reflect with other educators at a statewide symposium.

Since its inception in 2019, the Climate Justice League has supported over 200 teachers with an estimated reach of over 5,000 students across the state. The Climate Justice League will provide ongoing support and professional development for climate justice education, with additional resources made available through ClimeTime. ClimeTime is a state-led network and grant program that supports professional development for teaching climate science aligned with the Next Generation Science Standards.

Recognizing and addressing the interconnections between science and social justice is paramount. Successful climate educators must root inquiry in phenomena consequential for learners and communities, including social, environmental, and climate justice issues.

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DID YOU KNOW?

A (Climate Justice) League of Their Own

Why the Climate Justice League Works:

- The Climate Justice League is a model for phenomena-based instruction. This approach aligns with the current Next Generation Science Standards, an educational approach that uses real-world problems as the basis for teaching and learning.
- The Climate Justice League's cohort model invites collaboration as a means to achieve success. Participants agree that collaborative planning time is essential to engage in shared learning across design, implementation, and reflection.

Washington State has a total of nine Educational Service Districts (ESDs). The first Climate Justice League cohort launched in ESD 112; its successful professional learning model has since been open to teachers in all nine ESDs. This model has the potential to expand beyond the boundaries of the state as well.

The funding supporting ClimeTime professional development is a direct result of Washington State's climate change education policy. In spring 2018, Washington formalized climate change education through a legislative proviso (SB 6032, Section 501). ClimeTime grants serve all nine Educational Service Districts in Washington as well as tribal schools, community-based tribal education organizations, and community-based nonprofits.

For more information about ClimeTime and the Climate Justice League:

- Climate Justice League: https://www.climetime.org/climate-justice-league/
- Climate Justice League Design Principles: https://www.nsta.org/connected-science-learning/connected-science-learning-september-october-2021/building-teacher
- ClimeTime: Science Teacher Professional Development https://cdn.naaee.org/sites/default/files/2023-07/CCEP%20CS.ClimeTime.pdf
- ClimeTime: https://www.climetime.org/
- Association of Educational Service Districts: https://www.waesd.org/about-us/esds/

We long to belong, and belonging and caring anchors our sense of place in the universe.

— Patricia Churchland, Professor Emerita at the University of California, San Diego

C. Explore worldviews and perspectives

Educators engage learners in exploring their worldviews and perspectives as well as the worldviews and perspectives of other learners and community members.

Indicators:

- Explore differing worldviews concerning responsible and just climate resilience practices that lead to sustainable futures.
- Provide opportunities for learners to experience first-person narratives and stories that explore perspectives, knowledge systems, and resilience practices of communities with climate justice concerns.
- Investigate climate change concerns, considering evidence from different ways of knowing, including Indigenous Knowledge Systems. For example, provide opportunities for people who are knowledgeable about relevant fields and who represent differing points of view to share their experiences and wisdom through materials or direct communication with learners.
- Facilitate deliberative discussions where learners can weigh options to address climate change and climate justice concerns, including varying economic, political, and technological options.
- Provide opportunities to practice self-awareness, working effectively and sensitively across different cultural contexts.
- Support learners as they listen actively to the thoughts and perspectives of others, including being open to multiple ways of expression.
- Help learners recognize unfairness on the individual level (e.g., biased speech) and injustice at the institutional or systemic level (e.g., policy, law, governance) and how they contribute to climate injustice.

Ways of Knowing

How do we develop our understanding of the world around us? How is our worldview shaped? What's the role of culture and experience? These questions (and many more) delve into ways of knowing— "the tools we use to gather, create, represent and pass on knowledge."[1] As we think about environmental understandings and teaching others about the environment and climate change, considering our ways of knowing becomes increasingly important.

Although there are many ways of knowing, two are particularly relevant: Science as a way of knowing and Indigenous Knowledge Systems.

Science as a Way of Knowing

Understanding the nature of science has shifted considerably in the last several years, away from a more linear notion exemplified by the scientific method, to one that embraces science as a way of knowing. The National Research Council's Framework for K–12 Science Education elaborates on this:

> *Scientific knowledge is a particular kind of knowledge with its own sources, justifications, ways of dealing with uncertainties, and agreed-on levels of certainty. When students understand how scientific knowledge is developed over systematic observations across multiple investigations, how it is justified and critiqued on the basis of evidence, and how it is validated by the larger scientific community, the students then recognize that science entails the search for core explanatory constructs and the connections between them. They come to appreciate that alternative interpretations of scientific evidence can occur, that such interpretations must be carefully scrutinized, and that the plausibility of the supporting evidence must be considered. Thus students ultimately understand, regarding both their own work and the historical record, that predictions or explanations can be revised on the basis of seeing new evidence or of developing a new model that accounts for the existing evidence better than previous models did.*

Source: National Research Council. A Framework for *K–12 Science Education: Practices, Crosscutting concepts, and core ideas.* 2012. Retrieved from https://www.nextgenscience.org/resources/framework-k%E2%80%9312-science-education

[1] International Baccalaureate Organization. *Ways of Knowing*. n.d. Retrieved from http://sohowdoweknow.weebly.com/ways-of-knowing.html

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DID YOU KNOW?

Ways of Knowing

Indigenous Knowledge Systems

Indigenous Knowledge Systems, also sometimes known as Traditional Ecological Knowledge (TEK), Local Knowledge, Indigenous Ecological Knowledge, and Native Science, provide a deep understanding of the natural world that has been developed over generations. The Arctic Council Indigenous Peoples' Secretariat describes Indigenous Knowledge Systems as:

> *… a systematic way of thinking and knowing that is elaborated and applied to phenomena across biological, physical, cultural, and linguistic systems. Traditional Knowledge is owned by the holders of that knowledge, often collectively, and is uniquely expressed and transmitted through Indigenous languages. It is a body of knowledge generated through cultural practices, lived experiences including extensive and multigenerational observations, lessons, and skills. It has been developed and verified over millennia and is still developing in a living process, including knowledge acquired today and in the future, and it is passed on from generation to generation.*

Source: Arctic Council. *Ottawa Traditional Knowledge Principles.* 2015. Retrieved from https://www.arcticpeoples.com/knowledge#indigenous-knowledge

Overlapping Qualities of Indigenous Knowledge Systems and Science as a Way of Knowing[2]

Distinctions between science and Indigenous Knowledge Systems exist. However, Indigenous Knowledge Systems and science as a way of knowing have also been described in terms of overlapping domains, with common ground including habits of mind (e.g., perseverance and open-mindedness), skills and procedures related to observation and pattern recognition, and knowledge (e.g., plant and animal behavior, cycles, habitat needs).

Acknowledging both the distinctions and commonalities in these ways of knowing, scientists and Indigenous people are increasingly working together to document shifts due to climate change, monitor biodiversity loss, make resource management decisions, and address other sustainability issues.

If you want to learn more about ways of knowing, there are many excellent resources worth exploring.

- Anderson, C. *What are Indigenous Knowledge Systems—and How Can They Help Fight Climate Change?* TVO Today. 2021. Retrieved from https://www.tvo.org/article/what-are-indigenous-knowledge-systems-and-how-can-they-help-fight-climate-change
- European Research Council. *Bringing Indigenous and Local Knowledge to Climate Change Research*. 2022. Retrieved from https://erc.europa.eu/news-events/magazine-article/bringing-indigenous-and-local-knowledge-climate-change-research
- Indigenous Climate HUB. *Traditional Knowledge (TK) and Climate Change*. 2022. Retrieved from https://indigenousclimatehub.ca/traditional-knowledge-tk-and-climate-change/
- National Park Service. Alaska Nature and Science. *Using Indigenous & Traditional Knowledge to Adapt to Climate Change*. 2023. Retrieved from https://www.nps.gov/subjects/aknatureandscience/ccik.htm
- Tribal Adaptation Menu Team. *Dibaginjigaadeg Anishinaabe Ezhitwaad: A Tribal Climate Adaptation Menu*. Great Lakes Indian Fish and Wildlife Commission, Odanah, Wisconsin. 2019. Retrieved from https://glifwc.org/ClimateChange/TribalAdaptationMenuV1.pdf
- U.S. Climate Resilience Toolkit. *Guidelines for Considering Traditional Knowledges in Climate Change Initiatives*. 2022. Retrieved from https://toolkit.climate.gov/tool/guidelines-considering-traditional-knowledges-climate-change-initiatives
- U.S.G.S. *Indigenous Knowledge: Providing Insight into Climate Change*. 2022.Retrieved from https://www.usgs.gov/news/featured-story/indigenous-knowledge-providing-insight-climate-change

DID YOU KNOW?

Deliberation

What is deliberation?

> *The discovery of a shared direction, guided by what we value most.*
>
> *Deliberation is an unbiased kind of talking that starts where the problem starts—with your experience of it. . .*
>
> *Unlike debate, or lecture, or an airing of grievances, deliberation asks us to begin with what we hold most dear and share our personal experiences with a given issue. It's not about reaching agreement or seeing eye-to-eye. It's about looking at the costs and consequences of possible solutions to daunting problems, and finding out what we, as a people, will or will not accept as a solution.*

Source: National Issues Forums. *Deliberation.* 2023. Retrieved from https://www.nifi.org/en/deliberation

If you would like to learn more about deliberation, these resources may be of interest.

- Community Voices, Informed Choices (CIVIC), https://programs.ifas.ufl.edu/civic/
- Environmental Issues Forums, https://naaee.org/our-work/programs/environmental-issues-forums
- Kettering Foundation, https://www.kettering.org/
- National Issues Forums Institute, https://www.nifi.org/

D. Examine climate change information and misinformation

Educators provide opportunities for learners to practice climate communication strategies; explore climate change information, misconceptions, and misinformation; and investigate climate change controversies.

Indicators:

- Offer opportunities for learners to use multiple pathways for communicating, gathering information, and disseminating ideas. Support learners as they freely express their thoughts and conclusions using multiple ways of representation.
- Develop and practice deliberation skills to actively listen to other perspectives and recognize areas of common ground.
- Evaluate the accuracy, perspective, credibility, and relevance of information from a variety of sources related to climate science, climate justice, and climate change impacts and potential solutions.
- Use evidence-based strategies to investigate the scientific consensus regarding climate change and develop ways of communicating this scientific evidence to others.
- Explore common misconceptions about climate change and climate justice and consider why some people might hold these ideas.
- Construct arguments and communication strategies that address scientific misconceptions about climate change, climate justice, climate impacts, and possible solutions.
- Explore how climate misinformation and disinformation have been used over time to undermine social change and climate action. Identify key authors and distribution networks for climate disinformation.
- Employ research-based tools to build media literacy.

• See **Resource #10,** page 134, to learn about using reliable sources.

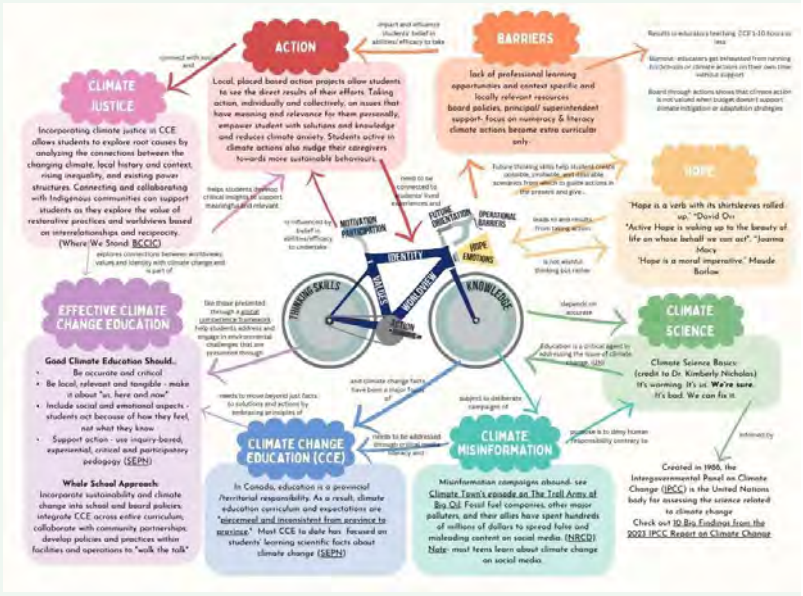
GUIDELINES IN PRACTICE

The Climate Institute: Together for the Future

Educators agree – there are not enough climate education resources available. To help address this issue, the Summer Institute's Climate Generation Conference brought together more than 40 Canadian presenters to share wisdom, resources, and expertise on climate topics. Dozens of dynamic, participatory sessions included practicing meaningful discussions with people with different views, addressing climate emotions personally and with students,
and taking local climate action at school.

To ensure teachers are more comfortable with climate topics, experts made the content relatable by tying it to other environmental studies, such as forestry and natural resources management. They made concrete curriculum connections based on Global Competencies from the Council of Ministers of Education in Canada and the 17 Sustainable Development Goals from the United Nations. Participants and presenters concluded that it is easier to source curriculum materials if they search on narrow topics rather than the broad strokes of climate change. An event outcome was ensuring that educators are empowered to bring the shared educational resources into their unique teaching settings to enact meaningful change for student learning.

This nationwide event offered optimal opportunities to explain how climate change can be discussed across many subjects and is not strictly limited to science.



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GUIDELINES IN PRACTICE

The Climate Institute: Together for the Future

Why the Summer Institute Works:

- The Summer Institute demonstrated dozens of accessible and ready-to-use tangible teaching resources, such as PLT Canada's e-unit, Climate Change and Forests: From Seed to Carbon Sink. The e-unit features curriculum connections, scientifically based content, and a user-friendly format.
- In addition to climate educators and scientists, The Summer Institute included Indigenous voices. "I really appreciated when our input was used to inform the discussions and appreciated having an Indigenous voice in the room to bring insights and thoughts," says Chris Drummond, a participating Ontario Environmental Educator.

The Summer Institute conference utilized a "Canada cohort day" to bring educators together from across the country. The Canada Cohort Day was a great opportunity to meet with climate educators and discuss the vital role of forests and forest management in climate change mitigation and adaptation.

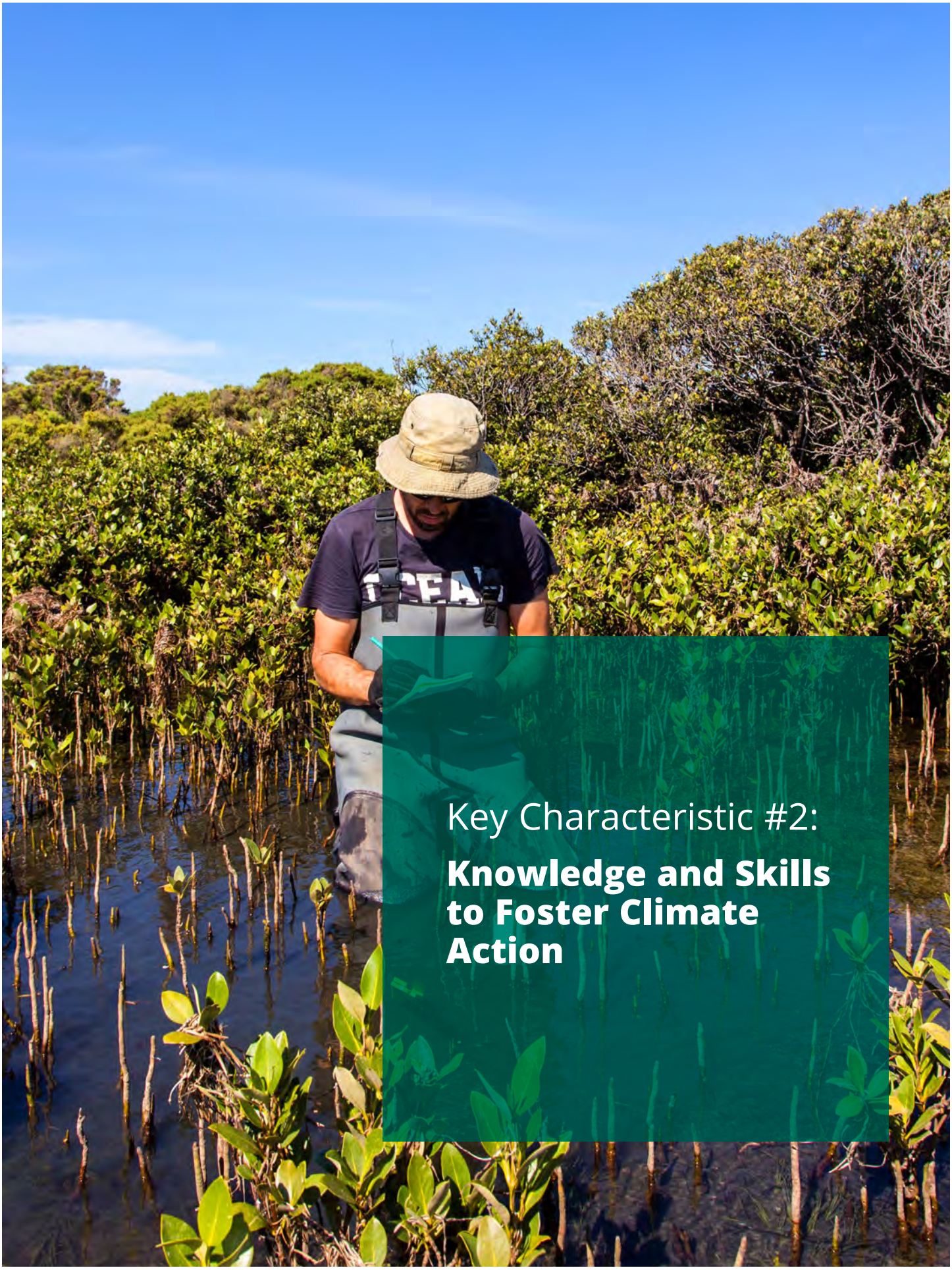
The Summer Institute created community. Participants confirmed the event was most helpful in re-engaging Canadian educators with an amazing community of teachers working on climate change education. "It is so helpful to see that we ARE a community, and we can support each other through the challenges," confirmed a 2023 Summer Institute Attendee.

For more information about Climate Generations' Summer Institute:

• The Summer Institute for Climate Change Education: https://climategen.org/summer-institute/
• Climate Generation: https://climategen.org/
• Council of Ministers of Education, Canada: https://www.cmec.ca/682/global_competencies.html

Education is not preparation for life;
education is life itself.

— John Dewey, Professor Emeritus,
Columbia University



Key Characteristic #2:

Knowledge and Skills to Foster Climate Action

Key Characteristic #2
Knowledge and Skills to Foster Climate Action

Effective climate action depends on developing an awareness and appreciation of the interrelationships of the natural environment of which we are part and an essential set of skills that enable learners to make informed decisions and to act individually and collectively. Effective climate action is rooted in the learner's understanding of Earth's processes and systems (e.g., atmosphere, hydrosphere, geosphere, and biosphere) and human systems (e.g., social, cultural, technological, political, and economic). Learners apply systems-thinking skills and develop an understanding of challenges, strategies, and skills for effective individual and collective action that lead to climate justice and climate change solutions. Learners build a sense of personal and civic responsibility.

Learners understand the importance of the relationships among ecosystem health, community well-being, long-term sustainability, and climate resilience and recognize that historic injustices faced by some communities and individuals contribute to disproportionate climate impacts.

A. Build awareness and appreciation

Starting with young children, educators provide learners with opportunities to build an appreciation that Earth is one living, dynamic community. Learners develop a basic awareness of environmental interrelationships and the interdependence of all life forms, including humans.

Indicators:

- Explore and describe how humans depend on and are affected by Earth's natural systems in their daily lives.
- Examine and explain the impacts, including climate impacts, of the mindset that humans are separate from nature.
- Investigate how climate change impacts are distributed across communities, regions, and the world and how inequalities affect exposure to climate change impacts among different groups (both human and other-than-human).
- Acknowledge that concerns about climate change can surface emotions and lead to anxiety, grief, and guilt. Identify and access the tools and resources that can be used to understand and address these emotions.
- Cultivate meaningful relationships with nature, other learners, educators, and community members that provide support and opportunities for taking action to address climate change and climate justice.

• See **Resource #11,** page 137, for examples of environmental education learning frameworks.
• See **Resource #12,** page 141, to learn more about using scientific investigations to develop caring practices for social-ecological systems.
• See **Resource #13,** page 143, to learn about talking with children about climate change and the Environmental Kinship Guide.

RESOURCES YOU CAN USE

Climate Literacy Guide

In 2023, the Climate Engagement and Capacity Building Interagency Group (CEG-IG) of the U.S. Global Change Research Program took on the task of updating C*limate Literacy: The Essential Principles of Climate Science* which was first published in 2009. The new guide reflects current climate science, engagement, and education methods and is designed to inform educators, decision-makers, and scientists.

To learn more about the Climate Literacy Guide, visit: U.S. Global Change Research Program, Climate Engagement and Capacity Building Interagency Group (CEG-IG). *Climate Literacy Guide*. n.d. Retrieved from https://www.climate.gov/teaching/climate

B. Understand climate processes and systems

Educators support learners as they develop an understanding of climate processes and systems (e.g., atmosphere, hydrosphere, geosphere, and biosphere) and how these systems interact with one another. Learners describe how human sustainability depends on Earth's climate systems.

Indicators:

- Explain, in simple terms, how climate is governed by Earth's systems. Describe the interactions between land, ocean, and atmospheric cycles and systems affect climate.
- Identify and access current information about climate change and projected futures from various sources and ways of knowing, including peer-reviewed science articles, knowledgeable adults or peers, Indigenous Knowledge Systems, and local knowledge.
- Describe the characteristics of the local climate using an array of information sources such as historical narratives, personal stories, Indigenous Knowledge Systems, maps, photographs, and data collected from satellites, ice cores, tree rings, and sediment cores.
- Describe how changes in one climate system (e.g., hydrosphere, atmosphere, geosphere, and biosphere) can change another.
- Analyze the impacts of climate change on biodiversity and ecosystem health.
- Investigate how changes in Earth systems affect human communities, including communities with climate justice concerns.

DID YOU KNOW?

Earth Systems

Our Earth is a complex system made up of many interconnected subsystems. These systems work together to maintain a delicate balance that allows life to thrive. Here are the five key Earth systems:

Atmosphere: The atmosphere is the thin layer of gases that surrounds Earth. It is composed of nitrogen, oxygen, carbon dioxide, and other trace gases. The atmosphere is crucial to regulating Earth's temperature and weather patterns.

Cryosphere: The cryosphere includes the portions of the Earth's surface where water is in solid form, including glaciers, ice caps, ice sheets, snow cover, frozen lakes, and permafrost.

Hydrosphere: The hydrosphere includes all the liquid water on Earth, including that in oceans, rivers, lakes, and groundwater. Water constantly moves through the hydrosphere in a cycle that includes evaporation, precipitation, and runoff. The hydrosphere also plays a crucial role in regulating Earth's climate.

Geosphere: The geosphere is the solid part of Earth, including the rocks, minerals, and soil. It is divided into several layers: the crust, mantle, and core. The geosphere helps to regulate Earth's climate and support life.

Biosphere: The biosphere includes all living organisms and their interactions with each other and the environment. The biosphere is closely connected to the other Earth systems and relies on them for energy and resources.

These systems are not independent. They are constantly interacting with each other. Water erodes rock. Nutrients from the soil are made available to plants and then animals. Carbon moves from the atmosphere to plants and then soil or animals. Changes in one system can have far-reaching effects on the others, and even small changes can cause significant disruptions to life on Earth. Understanding these systems is crucial for maintaining a sustainable future for Earth and its inhabitants.

For more information:
My NASA Data, About the Earth as a System: Background Information, n.d. https://mynasadata.larc.nasa.gov/basic-page/about-earth-system-background-information

GUIDELINES IN PRACTICE

Plan-It Marsh & Dunes Engages Students in Ecological Stewardship

Coastal marsh and dune systems provide communities with important ecological and economic benefits. Native marsh and dune habitats increase biodiversity, improve local water quality, and enhance aquatic and terrestrial ecosystems. Economically, marsh and dune habitats benefit communities by mitigating impacts from storms, preventing flooding and erosion, and supporting recreational activities.

Along the U.S. Gulf Coast, the need for marsh and dune restoration projects has become critical as climate change, increased development, poor management, and other factors have led to the deterioration of these habitats. However, with adequate resources, training, and effective education, this trend could be reversed through restoration of these vulnerable and degraded coastal habitats.

Plan-It Marsh & Dunes engages students

Staff from Mississippi State University's (MSU) Coastal Research and Extension Center are looking to inspire the next generation to become stewards of their environment. They created the Plan-It Marsh & Dunes programs to provide high school students with experiential learning opportunities that will affect positive change in their communities.

Plan-It Marsh was developed during 2019-2020 by a network of wetlands specialists at MSU and The University of Southern Mississippi's Gulf Coast Research Laboratory, along with environmental science teachers from three Mississippi Gulf Coast high schools. The focus of this program is to supply local high schools with the resources, training, and education to restore marsh systems. To achieve these goals, a complementary curriculum is given to teachers to pair with in-school educational training modules that develop skills in growing and planting native marsh plants.

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GUIDELINES IN PRACTICE

Plan-It Marsh & Dunes Engages Students in Ecological Stewardship



Students grow and plant for restoration

Student participation goes beyond the lesson plans. Throughout the school year, the students get outside and get dirty to oversee the plant growth. Students must work together to care for their plants and determine the best growing methods.

These activities create a sense of ownership and responsibility for their plants. At the end of the semester, students can transfer their plants to a local restoration site as part of a project-sponsored field trip.

In April 2022, a grant from the Environmental Protection Agency Gulf of Mexico Program allowed for the continuation of Plan-It Marsh and the addition of a dune-focused curriculum called Plan-It Dunes. Since then, five schools across the Mississippi Gulf Coast (approximately 95 students) have participated in the Plan-It Marsh and Plan-It Dunes programs. These students have propagated two marsh species (black needlerush and smooth cordgrass) and five dune species (dune sunflower, sea oats, panic grass, blanket flower, and beach morning glory) to restore approximately 1.5 acres of native habitat.

The project team is now working with partners across the Mississippi coast to publish applicable materials for educators throughout the southeastern United States. Staff is excited to see the expansion of this program in the coming years.

To learn more about PLAN-IT MARSH and PLAN-IT DUNES, visit https://coastal.msstate.edu/plan-it-marsh-plan-it-dunes.

Written by Nora Skinner, Extension Assistant, Coastal Conservation and Restoration Program, Mississippi State University's Coastal Research and Extension Center

C. Understand human systems related to climate change

Educators provide opportunities for learners to develop an understanding of human systems (e.g., social, economic, political, and cultural) and how individual and group action influences climate change, climate justice, and climate resilience. Learners analyze differing beliefs and values within the same community and the larger society and consider how sustainable solutions rely on reconciling diverse perspectives

Indicators:

- Analyze historical, ethical, cultural, geographic, economic, and sociopolitical relationships to further understand climate impacts and how these impacts are unevenly distributed across communities, regions, and the world.
- Apply research and analytical skills to describe how human resource consumption and the use of technology affect environmental health, the capacity to be self-sustaining, and natural systems, including climate systems.
- Recognize that despite overwhelming evidence about the causes of climate change, people have different beliefs that can make finding solutions more challenging. Consider ways that individuals and groups with different values and belief systems can listen to each other, identify shared goals, and take collective actions.
- Understand the importance of civic engagement and how policies related to climate change are made and implemented locally and nationally.
- Identify and describe barriers to climate actions and how they can be addressed (i.e., policies in schools, local and national governments, and organizations).
- Analyze how varying actions, both individual (e.g., home energy use, food consumption, and waste reduction) and collective (e.g., improvements in mass transit, protection of coastal wetlands, and implementation of carbon pricing), can contribute to climate change mitigation and adaptation.
- Investigate how communities with climate justice concerns understand local climate impacts and build systems to support community resilience.

DID YOU KNOW?

Human Systems

Human systems are the complex social structures and institutions that people have developed to organize themselves and interact with one another. These systems reflect the values, beliefs, and practices of the societies in which they exist. These are some key human systems:

- **Social system**: A structured and organized arrangement of individuals, groups, or institutions within a society, working together and interacting in a coordinated manner to fulfill various social functions and meet common needs, such as a neighborhood, Scout troop, or synagogue.

- **Political system**: A framework or structure within a society that governs the distribution and exercise of power, decision-making processes, and the organization of authority to manage public affairs and shape the laws and policies that impact the community. It is usually composed of government agencies, committees and commissions, and officials.

- **Economic system**: How societies organize and manage the production, distribution, and consumption of goods and services within a region or country. It includes a structure for exchange (i.e., money), industries and businesses, and investment capital.

- **Cultural system**: A complex and interconnected network of beliefs, values, customs, traditions, language, moral codes, and behaviors shared by a group of people within a society or community. It shapes their way of life, social interactions, and understanding of the world around them.

Human systems can have both positive and negative impacts on individuals, society, and the environment. They can promote social cohesion and collective action for good (service clubs) or bad (gangs) and also lead to social inequality and conflict.

Systems thinking is a discipline for seeing wholes. It is a framework for seeing interrelationships rather than things, for seeing 'patterns of change' rather than 'static' snapshots.

— Peter Senge, MIT Sloan School of Management

GUIDELINES IN PRACTICE

ClimaTeens for the Future

Often, young people do not have adequate access to job opportunities that couple conservation and civic engagement. The New England Aquarium in Boston, Massachusetts, offers teen-specific programs that reach youth at this impressionable, pivotal, and empowered age. For example, local teenagers—individuals 14–18 years old—are eligible for paid internships at the Aquarium. As a part of their internship experience, some teens participate in a second teen program offered by the Aquarium called ClimaTeens. Launched in 2013, ClimaTeens began simultaneously with the Aquarium's participation in the National Network for Ocean and Climate Change Interpretation (NNOCCI), with initial job placement funding made available through the city of Boston. The program continues to grow, garnering additional funding each year.

Since 2015, a cohort of approximately 20 ClimaTeens meets twice monthly from September to June. In the first semester, teens learn foundational knowledge about climate science and community organizing. In the second semester, ClimaTeens put their knowledge into action by developing a tool to help their community further investigate a climate issue. ClimaTeens then collaborate to develop and execute projects that bring climate change education to their community. While many of the ClimaTeens are paid participants, meaning they also hold internships at the Aquarium, other participating teens volunteer.

While the primary goal of the ClimaTeens program is to launch age-appropriate conversations about climate, program evaluations document increased participant self-confidence. Tiffani Macarelli, manager of youth development programs at the New England Aquarium, comments, "The success isn't what the youth create at the culmination of the ClimaTeens year. The true success is the investment in the teen to advocate for community climate solutions." The creation of conservation-and-climate-empowered youth, along with an activated, self-contained teen network, are two welcome byproducts of ClimaTeens.

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GUIDELINES IN PRACTICE

ClimaTeens for the Future

Why ClimaTeens Works:

- The Aquarium offers continued support for teen program alums Teen participants are encouraged to keep in touch with Aquarium-based outlets for news, events, and additional opportunities that are unique to them. In this way, program alums remain connected to support for their commitment to ocean concerns, climate issues, and the development of sustainable solutions.
- In addition to educational components, ClimaTeen meetings embrace social aspects. Each meeting is structured around a meal, which helps build community trust and confidence. This cornerstone of the program's success invites equitable and meaningful conversation among teen participants.

The New England Aquarium is a global leader in ocean exploration and marine conservation. It is one of the 237 Accredited Zoos and Aquariums, dedicated to providing best practices, news, and insights to the field. Other zoos, aquariums, and nature centers worldwide provide platforms for young people to initiate climate action.

For more information about ClimaTeens:

- New England Aquarium: https://www.neaq.org/
- Aquarium Teen Programs: https://www.neaq.org/engage/teen-programs/
- Association of Zoos & Aquariums: https://www.aza.org/

D. Apply systems thinking

Educators provide opportunities for learners to apply systems thinking to understand how human activities cause and help mitigate climate change, how climate change affects long-term environmental sustainability at varying, interconnected levels (e.g., local, tribal, national, and global), and why climate solutions help mitigate or adapt to change.

Indicators:

- Analyze the interrelationships among the causes, impacts, and possible solutions of climate change and climate injustices.
- Use an understanding of climate systems to identify local climate change concerns, including those that might result from climate mitigation and adaptation activities. Analyze the implications of these concerns for environmental health, long-term sustainability, community resilience, and climate justice.
- Identify the effects of human choices on climate systems and climate justice at varying, interconnected levels (e.g., local, tribal, state/provincial, regional, national, and global).
- Discuss the overlapping domains of social equity, economic prosperity, environmental sustainability, and cultural vitality and consider how they are impacted by climate change in a community. Consider how the impacts of and solutions to climate change are intertwined with issues of wealth, power imbalances among individuals and groups, poverty, inequality, and social justice.
- Analyze potential solutions to mitigate and adapt to climate change through a lens of overlapping social, economic, and environmental systems.
- Recognize that many solutions to climate change concerns can also solve other community challenges, and working toward change can build alliances across many interests. For example, describe ways training programs for new jobs can support climate justice and a community's transition to a low-carbon and sustainable economy.
- Illustrate the relationship between a community's infrastructure (e.g., housing, transport, power, water, higher education) and climate resilience.
- Research and draw conclusions about the connection between human health and climate impacts at the individual, family, and community levels using various sources and ways of knowing—including knowledgeable adults or peers, Indigenous Knowledge Systems, local knowledge, and peer-reviewed science.

Systems Thinking[1]

What is Systems Thinking?

Systems thinking is a cross-disciplinary approach to understanding how to think about real-world systems and the real-world issues we face. By understanding climate change as a complex system of interconnected parts, we can identify root causes and find solutions that work for the whole system.

Some key principles of systems thinking include:

- **A system is more than the sum of its parts.** A system is not just the individual components that make it up. It is also the relationships between those components.
- **Systems are complex and dynamic.** Systems are constantly changing and evolving. They are affected by internal and external factors.
- **Systems have feedback loops**. Feedback loops are the interactions between different parts of a system—the relationships between its inputs and outputs. These feedback loops can be positive or negative.
- **Systems have boundaries.** Systems thinking considers the boundaries of the system under study and its relationship with the external environment. Both internal and external factors can influence the behavior of the system.
- **Systems can be modeled.** We can represent systems using models that help us better understand them.

Systems thinking emerges when learners make distinctions, recognize systems and relationships, and take perspectives, acting in and on the world around them. These four cognitive skills, or simple rules, underlie even the most complex forms of thinking:[2]

1. **Distinctions Rule:** Any idea can be distinguished from other ideas.
2. **Systems Rule:** Any idea can be split into parts or lumped into a whole.
3. **Relationships Rule:** Any idea can relate to other ideas.
4. **Perspectives Rule:** Any idea can be the point of the view of a perspective.

[1] For a great introduction to systems thinking that includes easy to understand examples, review *An Introduction to Systems Thinking* (original works by: Draper L. Kauffman, Jr. and Donna Meadows, adapted by Andra Yeghoian). Retrieved from https://docs.google.com/document/d/1BuF9dEbNXfdYEg_BaDHVq-HGVzXCfhZPQQ0eLQjk5ok/edit

[2] Cabrera, D. and L. Cabrera. *Systems Thinking Made Simple: New Hope for Solving Wicked Problems in a Complex World*. Ithaca: Odyssean Press. 2015.

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DID YOU KNOW?

Systems Thinking

Making these skills explicit during instruction enables learners to evaluate and reflect on how they establish meaning and build knowledge—the mental models they use daily to navigate the real world. Beginning learners start with identifying and applying the simple rules in the world around them. Intermediate learners mix and match all four cognitive skills to build knowledge. Advanced learners become proficient in visualizing systems thinking to gain a deep understanding of concepts and ideas. By embedding systems thinking into climate change instruction, we help learners develop metacognition, thorough knowledge of content, and reasoning.

By applying systems thinking to address climate change, we can better understand the complexities and develop more effective, sustainable, and lasting solutions to this critical global challenge. We can use systems thinking to address climate change by:

- **Identifying its root causes**. Climate change results from complex factors, including human activity, natural variability, and feedback loops. Systems thinking can help us identify the root causes of climate change and develop solutions that address them.
- **Considering unintended consequences**. Examine how actions that mitigate climate change in one area may have unintended consequences elsewhere.
- **Identifying leverage points**. Identify the most influential points within the system where targeted interventions can create significant positive change. These leverage points could include policy changes, technological innovations, or shifts in societal behavior.
- **Adapting and learning**. Recognize that the climate system is constantly changing, and interventions must be adaptable to evolving conditions. Embrace a learning mindset, continually seeking feedback and adjusting strategies based on results and new insights.
- **Building resilience to climate change**. Climate change is already having a significant impact on Earth, and these impacts will only increase. Systems thinking can help us to build resilience by identifying and addressing the vulnerabilities of our communities and systems.

If you want to learn more about systems thinking, these excellent resources are worth exploring.

• Cabrera, D. and L. Cabrera. *Systems Thinking Made Simple: New Hope for Solving Wicked Problems in a Complex World*. Ithaca: Odyssean Press. 2015.
• Seibert, M. *Systems Thinking and How It Can Help Build a Sustainable World: A Beginning Conversation*. The Solutions Journal. 2018. Retrieved from https://mahb.stanford.edu/wp-content/uploads/2018/11/MAHBBonusBlog_SystemsThinkingandSustainability_Seibert-2018.pdf
• Yeghoaian, *A. Systems Thinking WebQuest for Students and Educators*. 2023. Retrieved from https://docs.google.com/document/d/1hxSBJWizvUQmzU3DDGvHU6yuuElSMe5_ujFi4JjepkI/edit

E. Develop action strategies and skills

Educators help learners understand a broad range of climate mitigation and adaptation action strategies. Learners develop personal skills in communication, collaboration, and leadership needed to work collectively toward climate solutions.

Indicators:

- Identify and describe what contributes to climate change and what individual and collective actions might be taken to reduce its impact (i.e., mitigating actions such as reducing the use of fossil fuels, using public transportation for vacations, gardening, increasing energy efficiency, changing diets).
- Analyze how a community might plan for projected impacts of climate change (e.g., raising bridges and roadways in flood zones, installing electric vehicle charging stations, moving vulnerable structures to higher ground, and planting crop varieties that thrive with less water or greater temperature ranges).
- Listen actively and present their own perspectives about possible climate mitigation and adaptation strategies. Consider which strategies are relevant and useful in their community to encourage personal and community actions.
- Take turns leading discussions in small groups and contributing to group decision-making.
- Discuss examples of how others work individually and collectively toward equitable climate solutions and how to participate thoughtfully in inclusive environmental and community decision-making.
- Exercise problem-solving skills by identifying an issue or concern, analyzing possible solutions, and deciding the best course of action.
- Practice conflict management skills when experiencing differing perspectives among individuals and groups.
- Engage in productive discussions and deliberation of local, national, and international issues related to climate change, climate resilience, and climate justice.

F. Build personal and civic responsibility

Educators support learners as they build an understanding that everyone, individually and collectively, can make a difference and contribute to climate solutions. Learners develop a willingness and ability to act on their conclusions about what should be done to work toward environmental quality and climate justice. By cultivating dispositions such as collaboration, responsibility, adaptability, and critical thinking, learners can develop capabilities for navigating the complexities of a world facing a climate crisis and contributing to a more resilient, adaptable, and just society.

Indicators:

- Describe the dynamics between exercising individual rights and responsibilities and addressing climate change and climate justice concerns.
- Explain the importance and evaluate the usefulness of civic principles such as trust, justice, patience, self-discipline, acceptance, civility, respect, adherence to law, opposition to tyranny, standing up for the rights of others, and open-mindedness to climate action.
- Exhibit personal agency by working independently and making choices to bring about just climate solutions.
- Examine and describe the current and potential impact that community members, individually and collectively, have in maintaining or improving environmental quality, ensuring climate justice, and building climate resilience.
- Provide examples of various groups and communities (e.g., family, childcare, youth club, school, town, state/province, tribe, nation, world) that have contributed to environmental quality, climate justice, and climate resilience.
- Investigate and describe ways in which one generation's decisions create opportunities and impose constraints on future generations.
- Analyze when it can be effective for individuals to take private and personal actions and when it can be valuable to take collective action with others.

• See **Resource #14,** page 145, for examples of great teaching resource guides.

GUIDELINES IN PRACTICE

Green Careers Academy Internship

The national sustainability education nonprofit EcoRise has found that deep and meaningful green career exploration experiences can be facilitated for high school students when the work and expertise of local community organizations is centered in program development. The organization has been refining its approach to facilitating high-quality, hands-on professional learning experiences that offer meaningful, practical, and equitable pathways to green careers for youth from communities that are underrepresented in the fields of sustainability since 2019. The Green Careers Academy Internship program served 7 students in Austin, TX, during the 2019–2020 school year and has grown to provide life-changing experiences for 54 students across four states in 2023.

> *I am so grateful I was able to have this opportunity; it has helped me further my knowledge, gain more experience, and open many doors for ideas about my future career and school path.*
>
> **— 2023 Green Careers Intern**

Today, the communities most impacted by climate change have the least representation in green career fields, such as sustainability, architecture, design, and others. The Green Careers Academy Internship program aims to create equitable pathways to green jobs for youth from these communities to ensure climate solutions are community-informed and serve the groups that need them the most. EcoRise focuses on recruiting students who identify with the groups that are underrepresented in green careers—namely, women and People of Color. Increasing diversity and representation in green career fields is crucial to irradicating systemic inequities and ensuring that people from all socio-economic backgrounds have a say in how we create sustainable solutions for a better world. Recruiting mentors who share these identities is also important to providing safe and authentic learning environments for the interns.

EcoRise's Green Careers Academy Internship creates high-quality, hands-on professional learning experiences for high schoolers in two stages. During Stage 1, interns participate as a cohort in professional development for early career and 21st-century skill-building and attend community-based field experiences. This foundational stage helps students "feel more ready for the professional world and more capable and confident in [their] abilities and knowledge," as a summer 2023 intern reflected. In Stage 2, each intern is placed with a green professional mentor in a local organization or company for a four-week, work-based learning experience that connects interns' environmental interests to their career pathways. The program culminates in showcase presentations that celebrate key learnings and project progress with the entire Green Careers Academy Internship community.

GUIDELINES IN PRACTICE

Green Careers Academy Internship

The key to this internship program is the hands-on projects students complete in partnership with their mentors. Volunteer green professionals from community organizations are recruited to foster learning experiences that help students connect their career pathways to making a meaningful impact on a local scale. For example, one intern tracked air quality in five Austin, TX locations, discovered the main pollutants in these areas, and researched and recommended improvements that would address problematic conditions. The intern's data analysis helped the city understand the tremendous impact of wind and construction activities on air quality. Other projects have included weatherizing buildings, optimizing HVAC systems, enhancing sustainability in food services, implementing outdoor learning for students, creating a podcast focused on local environmental changes in cooperation with an NPR station, and helping host community clean-up events. One 2023 intern reflected, "The internship has supported my recent decision to focus more on an environmental career. I'd already begun heading down that path but now I am feeling it even more so!" Another 2023 intern told us, "I changed my major because of this experience."

These experiences have profound impacts not only on the students and their chosen career pathways but also on EcoRise, which has been thrilled to receive feedback about capacity-building happening at the community organizations doing important frontline work. In 2023, mentors reported positive outcomes from the program, including "tackling work that we normally don't have time or funding for," "learning from [interns] about the need for advocacy at an earlier age," and "connecting with the youth of our city."

> *The EcoRise Green Careers Academy Internship program allowed our organization to tackle work that we normally don't have time or funding for while providing an engaging, relevant mentorship experience for a local student. We'll continue participating annually and recommend you do the same!*
>
> **— 2023 Green Careers Mentor**

The opportunities don't stop with the end of summer. EcoRise is working with community partners to host school-year paid internships, too. For example, five interns supported Galveston's Own Farmer's Market (GOFM) Young Gardeners Program in 2023. The interns spent eight weeks learning about garden maintenance, nutrition outreach, community organizing, and more. Aside from growing food, GOFM interns worked with elementary students in their gardens, supported vendors at the farmer's market each Saturday, and educated their community about food justice issues.

To learn more about Green Careers Academy and other EcoRise programs, read the 2022–2023 EcoRise Impact Report at https://bit.ly/22-23-impact, or visit https://www.ecorise.org/.

GUIDELINES IN PRACTICE

Engaging Students in an Action-Oriented Coastal Ecology Course

The Lloyd Center for the Environment (LCE) and the University of Massachusetts Dartmouth (UMass Dartmouth) forged a public-private research partnership to provide students aged 6 to 12 with hands-on environmental education learning experiences focusing on climate action opportunities. We believe that to empower communities for just climate action, we need to provide opportunities for students to operate as community leaders equipped to understand (1) the scientific knowledge underlying environmental issues, (2) the community they live in, and (3) the importance of engaging with scientists who are experts from the field. When partnered with a local research university, nature centers are well-situated to draw on students' everyday science knowledge to enhance the development of conceptual science understanding with an end goal of climate action at the individual and/or community level.

One product of this collaboration is a weeklong Coastal Ecology (CE) summer course taught at the LCE along with faculty from UMass Dartmouth. The CE course included topics such as nature photography, erosion, coastal biodiversity, birds, habitats, and human impacts on coastal ecology.

Action Oriented: Beach Clean-Up

Students were engaged in a nature photography workshop to learn how to take pictures in outdoor environmental settings. We combined nature photography and climate action perspectives to engage students in National Geographic's Debris Tracker citizen/community science project.[1] Participation included a beach clean-up activity where students took pictures of the trash they found. Students then helped one of the workshop educators enter the trash data on the portal and categorize it by type. The Debris Tracker project aims to contribute data on plastic pollution in local communities worldwide. We also carried physical trash bags and buckets to complete the beach clean-up process, collecting 90 items in 2022 and 277 in 2023. Students were engaged in discussions about different coastal bird habitats, their nesting sites, potential sources of the trash they find on the beach, and connecting these factors with overall climate change issues.

[1] Johnsen, K. (2023). Marine Debris Tracker (Version 5.6.0) [Mobile app]. App Store. https://apps.apple.com/us/app/marine-debristracker/id432758761?mt=8&ign-mpt=uo%3D4

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GUIDELINES IN PRACTICE

Engaging Students in an Action-Oriented Coastal Ecology Course

Community Driven: Role-Playing Coastal Community Erosion Activity
Students were also introduced to an engineering design activity to develop and implement a model to mitigate coastal erosion due to rising sea levels. Students were first introduced to the real-life problem faced by communities on Martha's Vineyard Island off the coast of New England.[2] Students were asked to assume they were part of this community, representing various interested parties. Students were then divided into groups and given materials (e.g., a paint tray with water and sand to replicate the coastal beach area, small rope, pebbles, rocks, clay, pipe cleaners, and model plants) they could use for their mitigation design keeping in mind the priorities of the communities they are representing.

Through these two activities, along with others, students begin developing conceptual understandings with an end goal of climate action at the individual and/or community level.

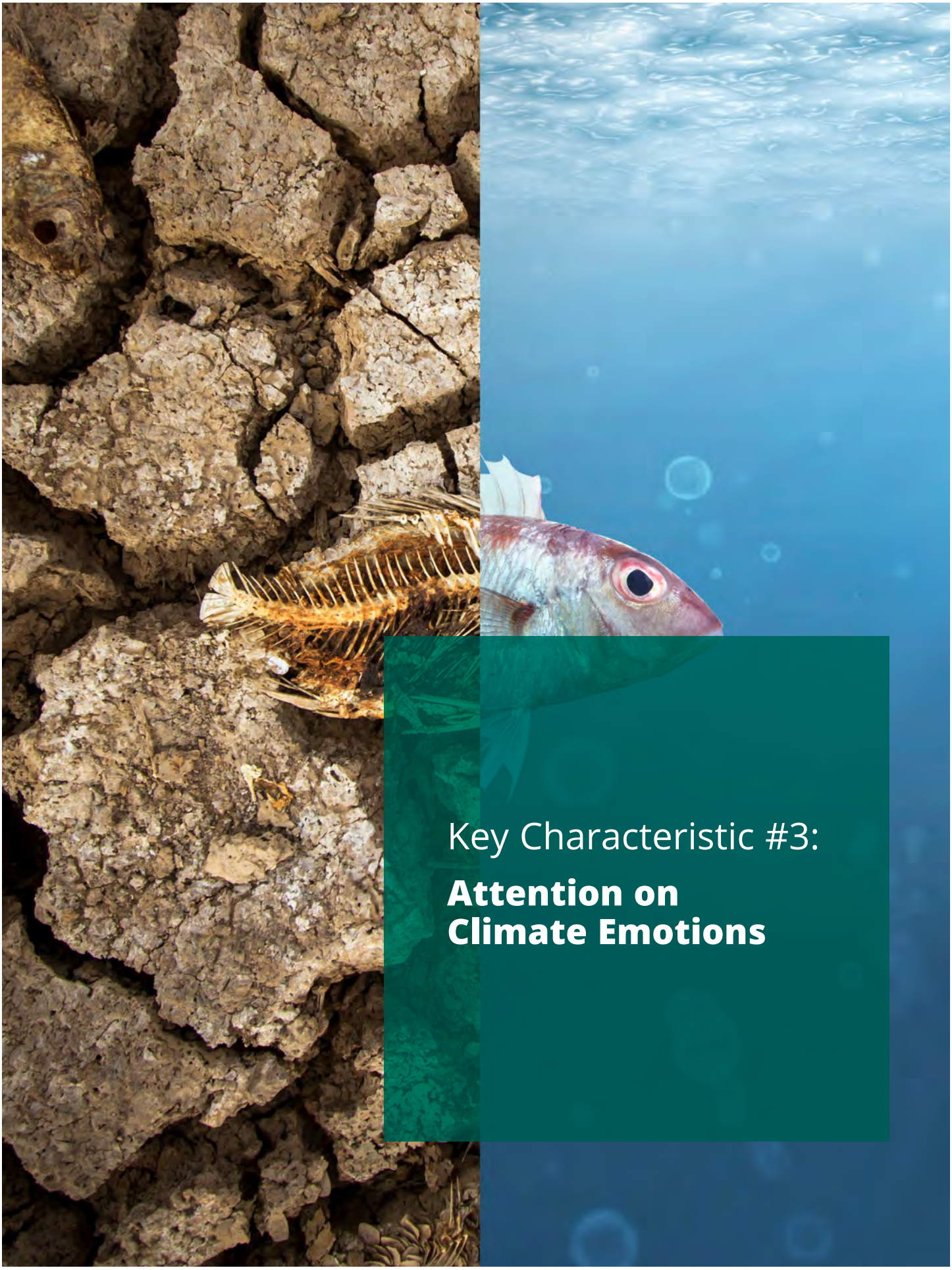
About LCE & UMass Dartmouth:
The Lloyd Center for the Environment is a nonprofit organization in Southeastern Massachusetts focusing on environmental research and education (www.lloydcenter.org). UMass Dartmouth—a Doctoral Research University with a High Research Activity (R2) Carnegie classification (www.umassd.edu)—distinguishes itself as a vibrant public institute that strives to engage students in innovative research, resulting in personal and lifelong student success.

Written by Hamza Malik, Teaching & Research Doctoral Fellow, Lloyd Center for the Environment & UMass Dartmouth; Rachel Stronach, Executive Director, Lloyd Center for the Environment; and Stephen B. Witzig, Associate Professor–Science Education, UMass Dartmouth

[2] Asimow, N., & A. Wilson. (2021, February 4). As Winter Storms Accelerate, So Does Coastal Erosion. Vineyard Gazette. https://vineyardgazette.com/news/2021/02/04/erosion

The systems-thinking lens allows us to reclaim our intuition about whole systems and hone our abilities to understand parts, see interconnections, ask "what-if " questions about possible future behaviors, and be creative and courageous about system redesign.

— Donella H. Meadows, Author, *Thinking in Systems, A Primer*



Key Characteristic #3:

Attention on Climate Emotions

Key Characteristic #3
Attention on Climate Emotions

Hope, optimism, anxiety, grief, and anger are all examples of the myriad reactions that learners may have to climate change and its impacts. Effective climate education recognizes that emotional reactions to climate change are normal and can serve as powerful motivators for action, but unfortunately, also inaction. Some emotional responses will spur climate action, while others may prevent people from even imagining how change could happen, especially with climate-just solutions. Successful climate education recognizes the need to address the range of emotions that climate-change impacts and climate injustices can surface. It also focuses learning opportunities on building constructive hope, mental well-being, self-efficacy, and agency. It recognizes that climate change is a long-term concern that requires perseverance.

A reasonable first step for educators is acknowledging emotions and providing space for learners and others, including themselves, to maintain their mental well-being and develop coping strategies. A more significant investment in assuring learners' mental health may require the assistance of a counselor or other mental health professional.

A. Recognize and acknowledge climate emotions

Educators support learners as they recognize and validate personal and emotional connections to climate change, climate injustice, and their impacts.

Indicators:

- Reflect on their experiences and perceptions about climate change and climate justice as they learn and engage with the community.
- Acknowledge that past experiences with climate impacts (such as severe weather events, wildfires, flooding, and displacement) and climate injustices may prompt strong emotional responses.
- Recognize that negative feelings like loss, anger, grief, and guilt are common responses to the climate crisis and can lead to feelings of helplessness, disengagement, justification of harmful behaviors, and denial of responsibility. Feelings can also catalyze individual and community resolve to take action.
- Access resources for addressing climate anxiety, grief, guilt, anger, despair, and trauma.
- Consider using art, humor, cartoons, visualization, and nature as sources of healing.
- Build bridges with partners and others in the community to strengthen social capital and cohesion. We are not alone.

• See **Resource #15,** on page 147, to learn more about climate emotions and ways of addressing climate anxiety.

DID YOU KNOW?

Climate Anxiety

The distress, fear, or worry that individuals may experience because of climate change's current and potential future impacts is termed climate anxiety. The scale and urgency of the climate crisis, along with the uncertainty and complexity of its consequences, can lead to feelings of powerlessness, hopelessness, and helplessness.

People may experience climate anxiety for various reasons, such as concern for the well-being of future generations, the loss of biodiversity, the impacts on ecosystems and natural resources, or the potential for social and economic instability. It is also common for individuals to feel overwhelmed by the magnitude of the problem, the lack of action by governments and other institutions, or the conflicting information and opinions surrounding climate change.

Climate anxiety can have a significant impact on mental health and well-being, including depression, post-traumatic stress disorder, and other stress-related conditions. However, there are ways to cope with climate anxiety, such as seeking social support, practicing self-care, reducing one's carbon footprint, and advocating for climate action at the individual, community, and policy levels.

According to Stephanie Collier, MD, MPH, climate anxiety "disproportionately affects children and youth."[1] Dr. Collier offers the following strategies for supporting young people:

- *Validate their concerns. "I hear you, and it makes sense that you are worried (or angry) about this issue."*
- *Help direct their efforts to advocacy groups. Spend time together researching organizations they can get involved with.*
- *Educate yourselves on steps you both can take to minimize your impact on the environment.*
- *Support your loved one's decisions to make changes to their lifestyle, especially changes they can witness at home.*
- *Spend time in nature with your family or consider planting flowers or trees.*

Source: Collier, S. *If Climate Change Keeps You up at Night, Here's How to Cope.* Harvard Health Publishing, Harvard Medical School. 2022. Retrieved from https://www.health.harvard.edu/blog/is-climate-change-keeping-you-up-at-night-you-may-have-climate-anxiety-202206132761

If you want to learn more about climate anxiety, here are some resources worth exploring:

- Schlumpf, H. *"You Are Not Alone": In Community, Young People Find Antidotes to Climate Anxiety*. Earthbeat. March 2024. Retrieved from https://www.ncronline.org/earthbeat/faith/you-are-not-alone-community-young-people-find-antidotes-climate-anxiety
- Uppalapati, S., M. Ballew, E. Campbell, J. Kotcher, S. Rosenthal, A. Leiserowitz, and E. Maibach. *The Prevalence of Climate Change Psychological Distress Among American Adults*. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication. 2023. Retrieved from https://climatecommunication.yale.edu/publications/climate-change-psychological-distress-prevalence/
- Wright, S. and E. Osterloff. *Eco-anxiety: How to Cope at a Time of Climate Crisis*. Natural History Museum. n.d. Retrieved from https://www.nhm.ac.uk/discover/how-to-cope-with-eco-anxiety.html
- Yale Sustainability. *Yale Experts Explain Climate Anxiety*. 2023. Retrieved from https://sustainability.yale.edu/explainers/yale-experts-explain-climate-anxiety

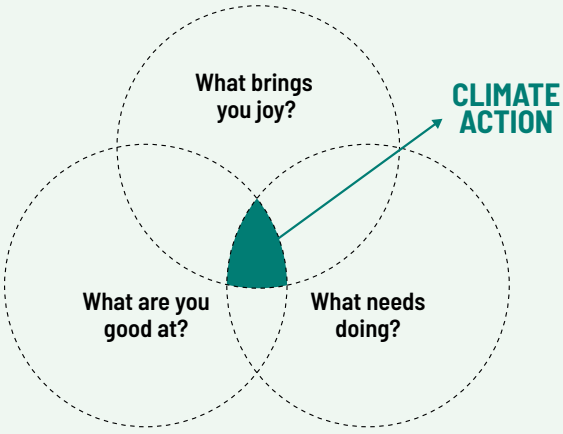
[1] Collier, S. *If Climate Change Keeps You up at Night, Here's How to Cope*. Harvard Health Publishing, Harvard Medical School. 2022. Retrieved from https://www.health.harvard.edu/blog/is-climate-change-keeping-you-up-at-night-you-may-have-climate-anxiety-202206132761

GUIDELINES IN PRACTICE

Youth Leaders Unite for Climate Action!

The Hitchcock Center for the Environment, in partnership with Mass Audubon, convenes a participant-driven Youth Climate Leadership Program designed to create opportunities for learning, dialogue, and action on climate change. Student participants attend workshops, tours, and interactive sessions designed to provide a balance of facts, tools for confidence building, and project stories for inspiration and hope. As a culminating project, student teams develop personalized action plans for their middle and high schools, to be implemented in the coming year. Teams of students from all over the Connecticut River Valley are invited to participate.

After nearly a decade, this Youth Climate Leadership Program continues to evolve. The intent is to transform the youth experience into a year-round program. An annual summit originated as the program culmination, but it has become the project kickoff and now occurs in early fall. Throughout the school year, youth participants meet regularly to work on their climate action projects. They connect with youth mentors for guidance and inspiration. In spring, there is now an annual Youth Leadership Showcase, where program participants share their climate work in progress. Community leaders and organizations often attend to learn about these youth climate leaders.



Participating youth are empowered to take climate action and make a difference in their communities. First, they get inspired by learning how the climate crisis connects to other social and environmental issues. Then, they connect with experts and peers on designing and implementing climate action projects. Finally, they work throughout the school year in youth-driven changemaker teams, collaborating to share their work in a Showcase Event at the end of the school year.

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GUIDELINES IN PRACTICE

Youth Leaders Unite for Climate Action!

Why the Youth Climate Leadership Program Works:

The Youth Climate Leadership Program attracts youth leaders and activates them in the context of a changing climate. "You think what you're doing is building youth leaders… but what you're really doing is just supporting them. The youth leaders are already there. They are already activists in their own right, and Hitchcock Center is just one of their outlets," says Billy Spitzer, Executive Director of the Hitchcock Center for the Environment.

- Program participants receive much-needed emotional support through their participation in the Youth Climate Leadership Program. Many of these youth leaders are already overcommitted and often experience substantial stress. They find essential social-emotional support in learning that they do not have to face the climate crisis alone.
- The Youth Climate Leadership Program recognizes that joining the fight against the climate crisis doesn't just mean combating climate change. It also means fighting for social justice because climate is, first and foremost, a human rights issue. The planning team prioritizes environmental justice as our number one issue.

This Youth Climate Summit network is powerful. The Hitchcock Center's Youth Climate Leadership Program was initially modeled on The Wild Center's Youth Climate Program. The Wild Center supports more than 30 locations worldwide that have empowered young people and taken climate action through a Youth Climate Summit. Youth anywhere can get connected to an existing summit or start their own.

For more information about the Youth Climate Leadership Program:

- Youth Climate Summit: https://sites.google.com/view/yclp/this-years-theme
- Toolkit for Youth Climate Leaders by Mass Audubon: https://www.massaudubon.org/content/download/50659/file/YCLP%20Toolkit_Feb%2023%202022.pdf?inLanguage=eng-US&version=2
- Western Massachusetts Youth Climate Summit: https://www.hitchcockcenter.org/western-mass-youth-climate-summit/
- Climate Action Projects: https://sites.google.com/view/yclp/climate-action-projects
- The Wild Center Youth Climate Program: https://www.wildcenter.org/our-work/youth-climate-program/

We need joy as we need air. We need love as we need water. We need each other as we need the earth we share.

— Maya Angelou, Memoirist, Poet, and Civil Rights Activist

B. Cultivate constructive hope

Educators support learners to positively and constructively engage with an uncertain future through the practice of hope.

Indicators:

- Reflect on the concept of constructive hope—sometimes known as active or transformative hope—and how it differs from optimism. Optimism is a positive outlook. Hope is a cognitive and emotional process of engaging with and shaping the future with a plan to achieve a goal.
- Be honest about the nature of climate problems and solutions. Recognize that although climate change is a serious problem, there are existing solutions (technological, political, economic, and social). Consider how people can work together to make these solutions a reality.
- Practice the process of "positive reappraisal," in which learners shift from the negative emotions of facing the climate change crisis to the positive emotions of exploring climate solutions.
- Use systems thinking to downscale global climate change to a local-level problem with imaginable solutions.
- Evaluate existing climate communication and propose ways to shift the messaging to solutions-oriented stories of hope.
- Use creative activities—including art projects, speculative fiction, and storytelling—to explore possible and preferable future scenarios. Hope involves identifying what you want and the paths to achieving these goals.
- Recognize that hope takes practice. It is more like a muscle than a feeling.

• See **Resource #16,** page 151, to learn more about balancing hope and threat and how to use the Hope Wheel.

DID YOU KNOW?

Climate Cafes

Climate cafes are informal, inclusive spaces where people can come together to talk about climate change and take action. They are designed to be a safe space for people to express their fears and uncertainties about the climate and ecological crisis. Climate cafes are community-led, often bringing together people from different communities, workplaces, and campuses.

Originally based on the Death Cafe model, the goal of climate cafes is to get more people talking regularly about climate change in a supportive and welcoming space. Climate cafes often organize events, speakers, movie nights, and other activities to help people get to know each other and connect with local action projects.

To learn more about climate cafes, here are some excellent resources worth exploring.

• Climate Café Hub. 2023. Retrieved from https://www.climate.cafe/
• Climate Mental Health Network. *What is a Climate Café?* 2023. Retrieved from https://www.climatementalhealth.net/climate-cafes
• Climate Psychology Alliance North America, https://www.climatepsychology.us/climate-cafes

GUIDELINES IN PRACTICE

Exhibit Climate Solutions to Create Climate Solutions

Ensuring a livable future relies on how quickly global systems can transition toward renewable energy and away from fossil fuels like coal, oil, and natural gas. The technology required to make this future possible already exists. For example, solar panels, wind turbines, and hydropower plants can provide clean energy to power transportation systems, homes, and workplaces. Transitioning to renewable energy will ensure lower carbon emissions, healthier communities, and cleaner air, water, and soil.

Enter Climate Solutions: a new, permanent museum exhibit that explores the encouraging stories of people across different backgrounds, generations, and sectors who are building a web of climate solutions in their lives and communities. Climate Solutions is in upstate New York at The Wild Center, which features a 54,000-square-foot indoor space filled with live exhibits, multi-media presentations, and many hands-on indoor and outdoor experiences.

The Climate Solutions exhibit highlights the stories of 12 people who live in New York State's Adirondacks region and are doing their part to confront a changing climate. The profiles include individuals working with Indigenous communities and their ancestral lands, rotational grazing and other sustainable farming methods, a youth-directed composting business, researchers, educators, artists, and young people. "The inspiration for this exhibit came from a long-time program at The Wild Center called The Youth Climate Program," says Jen Krester, Director of Climate Initiatives. Since 2009, the annual two-day Youth Summit has brought together young people to learn about climate science, impacts, and solutions. This event catalyzed a new direction for the museum, giving visitors the opportunity to find their place in the climate movement by applying what they learn to positive and constructive actions.

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GUIDELINES IN PRACTICE

Exhibit Climate Solutions to Create Climate Solutions

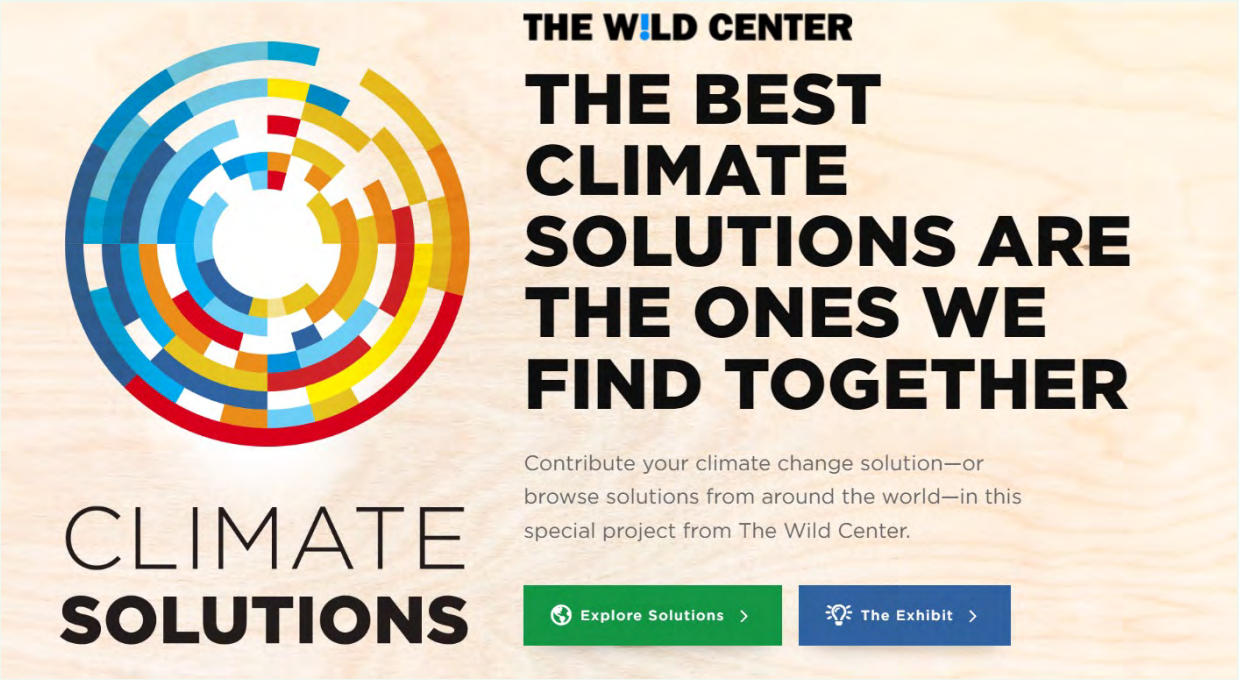
The Climate Solutions exhibit immerses visitors in a space that elevates the stories of people working on climate change solutions across New York State.

Why the Climate Solutions Exhibit Works:

- The Climate Solutions exhibit—as its name suggests—is founded on the power of solutions for a viable future. This vision of a possible and palpable sustainable tomorrow is both hopeful and powerful, especially when pitted against the climate anxiety that dominates many of our conversations today.
- Visitors to the exhibit, both in person and online, are invited to be part of the solution. Online viewers can contribute their solutions virtually using an upload tool at the Climate Solutions website.

For more information about the Climate Solutions Exhibit:

- Climate Solutions, Virtual Exhibit: https://wildclimatesolutions.com/
- The Wild Center: https://www.wildcenter.org/
- Climate Science Resources: https://wildclimatesolutions.com/science/
- "How The Wild Center's Climate Solution Exhibit Inspires Taking Action & Making A Difference" Podcast (25 mins): https://thoughtcard.com/climate-solutions-exhibit/
- Youth Climate Summit Toolkit: https://www.wildcenter.org/our-work/youth-climate-program/youth-climate-summit-toolkit/



C. Develop self-efficacy and agency

Educators support learners and their connections to communities to generate sustained purpose, self-efficacy, and agency.

Indicators:

- Facilitate active listening to support the development of understanding, empathy, and respect when learners and community members (including decision-makers) share their perspectives about climate change.
- Investigate how individual and collective actions can build self- and collective efficacy, both in addressing climate impacts and creating just solutions.
- Use case studies and other examples of individual and group actions to build knowledge, positive imagery, and hope.
- Explore personal, proxy, and collective agency, understanding that what one does individually and in groups can contribute to climate solutions and climate justice.
- Reflect on the importance of easy incremental successes and recognize that small wins are important in the long process to achieve change.
- Develop a sense of personal and civic responsibility, including a willingness and ability to take climate action.
- Reflect on what was learned and the actions taken. Value individual and group growth.

RESOURCES YOU CAN USE

Environmental *Change* Institute

The Museum of Climate Hope

Researchers from the University of Oxford's Environmental Change Institute collaborated with educators and curators at the university's museums, libraries, and gardens to create a museum trail and digital learning experience called the Museum of Climate Hope. This project highlights how climate education cuts across different school subjects and academic disciplines while showcasing historic examples of resilience, innovation, and transformation from around the world. Story maps explain each item and teaching notes offer sample discussion questions.

One example is a bronze age cauldron in the Ashmolean Museum. You might not think this had anything to do with climate change or hope, but there are several interesting themes to explore in this 3,000-year-old object. First, it is a massive cooking pot, which the community likely used collectively. Collective action in response to community needs is also important in our responses to climate change today. In addition, the bronze cauldron shows signs of repair over time; compared to our throw-away culture, this valuable object was mended to extend its use. Finally, the cauldron was discovered in a river in Oxfordshire and is believed to have been an offering to the river; in Bronze Age Britain, people were in tune with their natural environment.

Visit the Museum of Climate Hope at https://climatehope.uk/.

For more information on creative, interdisciplinary climate education, see:

- University of Oxford. Environmental Change Institute. I*ntroducing the Museum of Climate Hope*. September 13, 2023. Retrieved from https://www.eci.ox.ac.uk/news/introducing-museum-climate-hope
- UCL. IOE–Faculty of Education and Society. *Teaching for Sustainable Futures.* July 12, 2023. Retrieved from https://www.ucl.ac.uk/ioe/departments-and-centres/centres/centre-climate-change-and-sustainability-education/teaching-sustainable-futures
- Finnegan, W. *'It's Beautiful, Living Without Fear That the World Will End Soon'—Digital Storytelling, Climate Futures, and Young People in the UK and Ireland*. Children's Geographies, 21(5), 898–913. 2023. Retrieved from https://doi.org/10.1080/14733285.2022.2153329

Written by Bill Finnegan, Researcher, Education and Training for the Climate (ETC) at the University of Oxford.

DID YOU KNOW?

Defining Efficacy and Agency

We hope our learners will achieve their goals, especially climate change-related ones. But what factors contribute to their success in achieving those goals? Cognitive theory suggests that efficacy and personal agency are critical.

Individual Self-Efficacy

> *Self-efficacy refers to an individual's belief in [their] capacity to execute behaviors necessary to produce specific performance attainments. … Self-efficacy reflects confidence in the ability to exert control over one's own motivation, behavior, and social environment. These cognitive self-evaluations influence all manner of human experience, including the goals for which people strive, the amount of energy expended toward goal achievement, and likelihood of attaining particular levels of behavioral performance.*

American Psychology Association (APA). *Teaching Tip Sheet: Self-Efficacy*. 2009. Retrieved from https://www.apa.org/pi/aids/resources/education/self-efficacy

Collective Efficacy

> *A group's shared belief in its conjoint capability to organize and execute the courses of action required to produce given levels of attainment.*

Bandura, A. *Self-Efficacy: Toward a Unifying Theory of Behavioral Change*. Psychological Review, 84, 191-215 1977. Retrieved from https://psycnet.apa.org/record/1977-25733-001

Personal, Proxy, and Collective Agency

> *Agency refers to the human capability to influence one's functioning and the course of events by one's actions.*
>
> *People exercise their influence through three forms of agency: individual, proxy, and collective. In agency exercised individually, people bring their influence to bear on what they can control. In proxy agency, they influence others who have the resources, knowledge, and means to act on their behalf to secure the outcomes they desire. In the exercise of collective agency, people pool their knowledge, skills, and resources and act in concert to shape their future.*

Bandura, A. *Agency*. 2023. Retrieved from https://albertbandura.com/albert-bandura-agency.html#:~:text=In%20the%20exercise%20of%20collective,a%20psychology%20of%20human%20agency.

GUIDELINES IN PRACTICE

Students Taking the Lead: Insights from the Pre-K-12 Youth Climate Summit

We educators see it every day: the aftermath of COVID in the classroom. Quarantines wore away schools' sense of community. Our students struggled to find their place in this new "normal." Fear, anxiety, and screen time have taken the place of going outside to explore with friends, looking under rocks, and just enjoying the sunshine for so much of today's youth. Students need connection—to each other, to themselves, and to nature—and so does our planet.

One of the most pressing issues for today's youth often goes unspoken, yet it's the foundation of an underlying and growing dread so prevalent that it's coined a new name: eco-anxiety. Students terrified about climate change feel powerless. As the Coordinator of Environmental Education for the Garrison Union Free School District in Garrison, New York, I've witnessed the hopelessness and feelings of personal guilt from my students first-hand.

I have heard students say, "It's inevitable."

"It's terrible."

And "I wish there was something I could do to help."

This eco-anxiety, paired with the post-COVID yearning for connection, has fostered a potent cocktail of new and powerful needs among today's students.

On May 12th, 2023, I witnessed something truly special: the first-ever Pre-K-12 Youth Climate Summit held at my school district. The Summit seamlessly addressed the growing social-emotional-environmental needs of today's students, all while empowering them to take civic action. This event was a symposium for elementary, middle, and high school students to connect to themselves, each other, and nature through curated hands-on workshops.

Kicking off the event were the ten 4th–8th-grade climate activists who led a keynote presentation based on their personal research-driven climate stories. Next, Pre-K-8 Garrison students became peer educators who presented their unique long-term sustainability projects to the public. These presentations strengthened their peers' environmental awareness, knowledge, and stewardship. Then, middle and high school students from seven other schools in New York and Connecticut led their own workshops, presenting their own eco-driven research. Topics ranged from the cost-benefit analysis of using recycled paper to the effects of Hurricane Sandy on humpback whale populations in the New York Bight and everything in between. We also had five of our Garrison students work with a local journalist to report on the event. Students drove the learning and, through that vision, fully immersed themselves in the Summit and what it stands for.

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GUIDELINES IN PRACTICE

Students Taking the Lead: Insights from the Pre-K-12 Youth Climate Summit

Through hands-on workshops led by guest experts in their fields, students also learned about the wide variety of careers in which sustainability plays a role. Examples include Sustainability through Architecture, Libraries, Business, and Art, Live Reptiles and Live Birds of Prey, Climate Justice and Eco-Poetry, the Green Machine (a hands-on renewable energy truck), Electric Vehicles, Hybrids, and Solar-Powered Vehicles, and Ecology in our 181-acre school forest, among many others.

Collaborating to Turn Climate Anxiety into Climate Action

Student presentations and workshops alike reflected the spectrum of issues and solutions related to human-induced climate change. Garrison second- and fifth-grade students continued their long-term citizen science project, measuring carbon sequestration in the trees of the GUFS school forest. And seventh-grade students engineered solutions to the UN Sustainable Development Goals through the lens of biomimicry. Students of all ages innovated solutions to local and global environmental issues, educating the public along the way. No matter which room you walked into, you'd see students across grade levels collaborating to turn climate anxiety into climate action.

Celebrating Student Leadership

The May 2023 Summit was a celebration of climate action, driven by Pre-K-12 students themselves. Even the Summit's logo was designed by an impassioned seventh-grader! Although the event only lasted a day, it represents the foundation of environmental education, interwoven into the cross-curricular fabric of The Garrison School's Pre-K-8 classrooms. Furthermore, it shows how determined students are to enact positive change for our global ecosystems and how their need for connection can manifest itself in collaborative problem-solving.

To learn more about the Youth Climate Summit, including future Youth Summits, and interdisciplinary environmental education in the classroom, visit: https://sites.google.com/gufs.org/youthclimatesummit/home

Written by Rachel Arbor, Pre-K-8 Coordinator of Environmental Education STEAM teacher, Garrison Union Free School District, Garrison, NY, and CEO of Gaia Scholastic Consulting Services, rachelnarbor@gmail.com

Key Characteristic #4:

Locally Focused and Community Driven

Key Characteristic #4
Locally Focused and Community Driven

Climate impacts and opportunities for action will be different in every community. Effective climate education respects and supports the local community. A community might be a school, childcare center, business, nonprofit organization, neighborhood, park, town, city, or even a region or state/province. Successful engagement strategies provide opportunities for learners and other community members to participate in conversations about concerns and consider potential solutions.

To be effective, climate education engages learners' interests, priorities, challenges, and capacities while addressing community members' priorities and climate justice concerns. Building trust and partnerships (such as with school custodians, apartment building owners, youth clubs, faith-based groups, local agency staff, members of civic organizations, or homeowners' associations) is essential, and incorporating the community's diverse experiences and knowledge is vital to creating community-driven, responsive, and appropriate climate action.

A. Know the community

Educators guide learners as they build a detailed understanding of their community. For example, learners describe the community's geographic location, ecosystems, experiences with climate change and impacts, community assets, leadership, decision-making processes, and past and current efforts to address climate justice.

Indicators:

- Describe community assets, relationships, aspirations, and needs. Learners might conduct a community assessment to identify social and ecological characteristics, relationships, and challenges using various methods, like conducting community interviews, engaging with stories from intergenerational community members, or holding a neighborhood gathering.
- Develop an understanding of the composition and history of the community, including geographic boundaries, landforms and waterways, infrastructure, cultures, and demographic characteristics.
- Investigate the past impacts and future projections of climate change in the community, including the frequency of events, including storms, flooding, heatwaves, and wildfires.
- Determine which individuals or populations in the community are most affected by climate change, positively and negatively, how they are affected, and what they believe might be needed.
- Describe current and past efforts to address climate injustice, increase community sustainability and well-being, improve climate resilience, and work toward climate solutions. Learners might investigate how access to food, water, shelter, and a clean environment has been protected, particularly for those most affected by climate change.
- Investigate workforce development needs and opportunities that support climate mitigation and adaptation.

• See **Resource #17,** page 153, for a list of tools for identifying local environmental impacts.

GUIDELINES IN PRACTICE

Becoming Water Wise

Green infrastructure is a tool being leveraged by a nonprofit collaboration called Water Wise Gulf South (Water Wise) to improve stormwater management. Water Wise is a group of community-based organizations that share a commitment to strengthening public awareness and the use of green infrastructure. Their mission is to empower individuals, neighborhoods, and marginalized communities to manage stormwater, thereby reducing localized flooding—and achieving other benefits!

Water Wise Gulf South collaborates with local groups such as landscape architects, philanthropic organizations, and other community education and environmental initiatives. This community-based approach builds leadership and demonstrates green infrastructure systems through a multi-faceted approach that includes technical assistance, educational programming, leadership training, and implementation. These elements manifest as green infrastructure events, tours, do-it-yourself workshops, demonstration projects, and leadership training.

To support the implementation of this work, Water Wise Gulf South has grown a network of community advocates known as the Water Wise Neighborhood Champions. Water Wise respects that residents must be in the driver's seat when advancing green infrastructure in their communities. In 2016, the first Water Wise Neighborhood Champions Training was open to any New Orleans, Louisiana, resident who had already attended a Water Wise Green Infrastructure 101 Workshop. The Neighborhood Champions also participated in a tour of local green infrastructure projects and Visioning Sessions to identify green infrastructure projects in their neighborhoods. To date, 175 Water Wise Neighborhood Champions have envisioned over 120 green infrastructure projects. These projects often begin at the homes of Water Wise Neighborhood Champions but expand to small businesses, churches, community centers, vacant lots, and public rights-of-way.

Nature-based solutions to reduce the effects of climate change bring about a sense of community around a common issue. "None of us can control nature and the environment, but we can do something to mitigate those changes and slow down the effects that impact us," says Dr. Angela Chalk, founder and executive director of Healthy Community Services. She continues, "Most importantly, the people need to be respected and heard. … This is how we are going to be able to mitigate the effects."

continued on the following page

GUIDELINES IN PRACTICE

Becoming Water Wise

Why Water Wise Works:

- The Water Wise approach is four-fold: collaboration, education, implementation, and advocacy. Program participants raise awareness, provide education on green infrastructure, and advocate for implementing community-scale green infrastructure installations.
- Water Wise intentionally focuses on BIPOC communities (Black, Indigenous, and People of Color). These green infrastructure projects are successful because they are envisioned by community residents for community residents. These community residents are already experts on the issues that affect their communities. When they marry this expertise with newly learned information about green infrastructure, they become champions for advancing green infrastructure in their neighborhoods in a way that genuinely serves the place in which they live.
- The Water Wise program shows results. Cheryl Austin, executive director of Greater Treme Consortium, comments, "One of the most important things you can do in a community is show results." Projects envisioned by the Water Wise Neighborhood Champions manage approximately 100,000 gallons of water per rainstorm event. "Together, these projects bring $17 million of ecosystem benefits to the city of New Orleans," says Jeffrey Supak, executive director and cofounder of Water Wise Gulf South.
- Water Wise has evolved into a collective of community-based organizations, including a formal partnership between half a dozen entities, from community services to neighborhood and homeownership associations. Learn more at https://waterwisegulfsouth.org/.

To learn more about Water Wise:

- Video, Water Wise Model: https://youtu.be/b_CSWYspExM (5 minutes)
- Water Wise YouTube Channel: https://www.youtube.com/ @WaterWiseGulfSouth
- Every Drop Nola: http://everydropnola.com/
- Seventh Ward Green Infrastructure Lookbook: https://pbrown7.files.wordpress.com/2019/06/7th-ward-lookbook.pdf
- Ninth Ward Green Infrastructure Lookbook: https://pbrown7.files.wordpress.com/2020/04/1709_u9-lookbook_v4.pdf
- Water Wise Gulf South: https://waterwisegulfsouth.org/
- Water Wise 7th Ward: https://waterwisegulfsouth.org/7th-ward/
- Water Wise Upper 9th: https://waterwisegulfsouth.org/water-wise-9th-ward/

B. Identify key individuals, organizations, and communities of interest

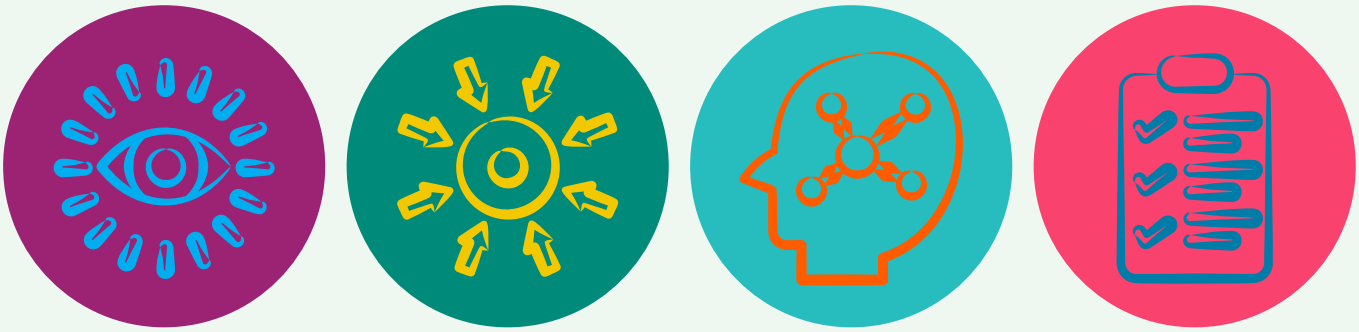
Educators help learners recognize that climate action requires the involvement of community members—from individuals to nonprofits, corporations, policymakers, and more. Learners build relationships with community members who can assist in understanding the issues and who will be involved in taking proposed actions, partners who can help imagine, improve, and approve the proposed actions, and those who will be affected by the action or inaction.

Indicators:

- Identify allies and supporters of climate change efforts as well as those who might not see the efforts as a priority. Analyze their strengths, funding and other resources, standing in the community, and ability to provide expertise. For example, learners gain expertise and insight by contacting:
  - Institutions, organizations, and agencies that offer climate-related social services in the community, such as assistance for those who are food insecure, older, unhoused, and unemployed or underemployed
  - Government agencies and elected officials involved directly in the development of policies and procedures related to climate change and climate justice (e.g., planning, emergency services, fire, transportation, environmental quality, natural areas, education, engineering, and child welfare)
  - Individuals and groups engaged in social, environmental, and climate justice efforts, with particular attention to the local community
- Gather information about individuals with complementary concerns and goals (e.g., school principals and superintendents, members of the media, community leaders, business leaders, advocates and activists, faith leaders, medical professionals, educators, and school board members), analyze their interests, and consider how their concerns and goals might intersects with climate change-related interests.
- Identify individuals and organizations that embody different ways of knowing that can help guide an understanding of the issues and potential solutions, including Indigenous Knowledge Systems, local knowledge, and science-based sources.
- Reach beyond existing networks and develop new partners and collaborators, including those who may have been left out of previous efforts and those who represent different backgrounds, diverse voices, and a variety of cultures. Build relationships with individuals and organizations known and trusted by communities with climate justice concerns.

• See **Resource #18,** page 155, to learn more about fundamental best practices of community engagement, including suggestions for identifying frontline representatives.

RESOURCES YOU CAN USE



Multisolving

Multisolving aims to simultaneously address multiple issues or challenges at once through integrated and interconnected solutions. It recognizes that many challenges societies, organizations, and individuals face are interconnected and can often be tackled more effectively by considering their interdependencies. Multisolving encourages collaboration and a holistic perspective, and it considers the broader impacts of actions taken to solve a particular problem. For example, a city might implement policies addressing both transportation and air quality concerns by promoting cycling infrastructure and electric vehicle adoption, leading to reduced traffic congestion, improved air quality, and enhanced public health.

The Multisolving Institute[1] describes it this way:

> *When people work together across sectors to address multiple problems with one policy or investment, they are multisolving. A good example is how walkable cities help reduce emissions from transportation, provide equitable access to mobility, create healthier citizens, and help local businesses thrive. Multisolving is a way to look at the whole picture and help everyone. But multisolving isn't always easy or simple.*

The Multisolving Institute has created a community engagement tool, dubbed FLOWER[2] (Framework for Long-Term, Whole-System, Equity-Based Reflection), that "helps a group explore the co-benefits a project might produce. It prompts some of the most important questions about multisolving. Who would need to be involved? How do we design for co-benefits? How do we ensure burdens and benefits are shared equitably?"

Using the FLOWER framework, groups examine proposed projects and consider the connections among Health and Well-Being, Resilience, Climate Protection, Jobs and Livelihoods, Biodiversity, Energy and Mobility, and Food and Water, with a focus on Equity.

Additional resources about Multisolving that you might find interesting:

- Sawin, E. *Op-Ed: We Must Adapt to Climate Change. Can We Do It in Ways That Solve Other Problems Too?* Environmental Health News. 2022.
  Retrieved from https://www.ehn.org/climate-change-adaptation-2656805797/weaning-off-fossil-fuels
- Sawin, E. *The Magic of Multisolving*. Stanford Social Innovation Review. 2018.
  Retrieved from https://ssir.org/articles/entry/the_magic_of_multisolving
- Sawin, E. *The Power of Multisolving for People and Climate*, TEDx SunValley. 2019.
  Retrieved from https://www.youtube.com/watch?v=prF8trTallQ&ab_channel=TEDxTalks

[1] Multisolving Institute, https://www.multisolving.org/
[2] Multisolving Institute. FLOWER: Framework for Long-Term, Whole-System, Equity-Based Reflection. 2022.
Retrieved from https://www.multisolving.org/flower/

C. Build partnerships and collaborative relationships

Educators provide opportunities for learners to recognize that authentic, trustworthy, effective partnerships, and collaborative relationships take time to develop within any community and require a willingness to learn continually from each other's experiences and perspectives regarding climate impacts, climate justice, and climate resilience. The scale of the partnership or collaborative relationship respects the ability of those involved to dedicate needed time and resources.

Indicators:

- Listen to potential partners' perspectives and experiences, including how they talk about the community (its past, present, and future) and climate change.
- Identify the co-benefits—shared interests and objectives—of working together toward climate action and climate justice.
- Build trust and create supportive environments that are conducive to the personal growth and wellness of everyone involved (e.g., partners, collaborators, learners, educators, and others).
- Engage community leaders, government officials, and elected representatives, especially those already working on climate change impacts and climate justice concerns. Explore their priorities, capacities, and perspectives on collaborative opportunities.
- Consider working across generations to build intergenerational power through relationships with more community partners and other collaborators.
- Understand that partners and collaborators may hold differing priorities, which may influence their willingness or ability to participate in climate-related partnerships and initiatives. Devote resources and energy to reduce perceived and real barriers to participation.

GUIDELINES IN PRACTICE

Resilient East Biloxi

Like many across the Mississippi Gulf Coast, East Biloxi residents have witnessed firsthand the damages resulting from natural and human-made climate disasters. These climate stressors have continuously impacted East Biloxi's natural resources, which are fundamentally tied to the community's social and economic well-being. Resilient East Biloxi, a collaborative project, was founded in partnership with the East Biloxi Community Collaborative, the Steps Coalition, the Biloxi chapter of NAACP, and the Gulf Coast Community Design Studio to produce culturally competent resilience trainings and publications to advance lasting community-driven change in East Biloxi.

Resilient East Biloxi hosts a series of community leader trainings and resident engagement events to achieve the following:

- Promote redevelopment that reflects and has a sense of ownership by the community
- Provide space for community leaders to engage with and communicate resilience issues and solutions to residents
- Develop strategies to skillfully and effectively direct solutions to address unbridled socioeconomic disadvantages
- Increase organizational capacity for the implementation and funding of community-led redevelopment projects
- Promote collaboration across diverse organizations and leaders to address the social determinants of health for East Biloxi[1]

Resilient East Biloxi Community Development Leadership Program consists of a four-part series of training sessions, each focusing on a different aspect of contributing to a safe, sustainable, thriving East Biloxi. The series makes sure that community leaders have the skills, knowledge, and opportunity to shape how redevelopment is implemented. Participants also help plan and implement a strategy for engaging residents throughout East Biloxi on these same topics.

The community leaders chose to focus on the following six community pillars based on the Social Determinants of Health: quality healthcare, neighborhood and built environment, social and community context, quality education access, economic stability, and food access. Leaders also added a pillar of equity and justice. Subcommittees for each pillar were formed with the purpose of identifying stakeholders, leadership, funding opportunities, and what resilience work is and is not already happening in East Biloxi.

Written by Qiyamah Williams, Community Resilience Specialist, PLACE: SLR.

For more information about Resilient East Biloxi, visit https://placeslr.org/our-work/activeprojects/resilient-east-biloxi/

Resilient East Biloxi is part of the Program for Local Adaptation to Climate Effects: Sea-Level Rise (PLACE: SLR) which is a partnership between Mississippi-Alabama Sea Grant Consortium, Florida Sea Grant, NOAA Sea Grant, and Mississippi State University Extension. For more information about PLACE: SLR, visit https://placeslr.org/

[1] Resilient East Biloxi. Social Determinants of Health. Retrieved from https://placeslr.org/wp-content/uploads/2023/03/2023-SDoH.pdf

D. Collect community concerns about climate actions

Educators support learners as they and their partners and collaborators listen to community questions and concerns about climate change, climate justice, and climate solutions.

Indicators:

- Recognize that members of communities, including communities with climate justice concerns, may hold a wide range of climate action priorities based on their lived experiences.
- Use newspaper articles or meeting notes to develop an understanding of the concerns voiced in the past.
- Interview community members, hold a focus group discussion, or conduct a survey to learn more about community concerns.
- Listen carefully to what others in the community identify as important, what they consider the most significant risks or concerns, and how they talk about climate change. Be mindful of diverse ways of knowing, including Indigenous Knowledge Systems and local knowledge held in the community.
- Convene deliberative forums that engage community members in structured discussions of climate change impacts and possible courses of action.
- Share examples of how others are learning about and working to resolve community concerns.

• See **Resource #19,** page 161, to learn about using local phenomenon to communicate climate solutions, and resources such as CIVIC and the Yale Program on Climate Change Communication.

RESOURCES YOU CAN USE

Climate Convenings Toolkit

Climate Generation published the *Climate Convenings Toolk*it as a "How-To Guide for Inspiring Local Stories and Community Solutions on Climate Change." The toolkit, along with a set of detailed templates, provides a way forward for encouraging meaningful public engagement on climate change.

Convenings are built around the following theoretical framework, which was tested through convenings in Minnesota:

1. **Start with the community and what they care about—connect on common values**
2. **Strive to make the event a mirror of the community**
3. **Recruit peer groups**
4. **Focus on local impacts**
5. **Be solutions-focused**
6. **Connect through stories**
7. **Include trusted messengers of community, science, and solutions**
8. **Provide real, tangible solutions**
9. **Provide multiple opportunities to engage in different ways**
10. **Follow up**

The Convenings Toolkit includes recommendations for planning and implementation, including a sample convening agenda and suggestions for types of presenters and presentations (e.g., trusted community leader, community resource fair, climate science presenter, a community storytelling panel, and solutions workshops). A timeline is detailed, and suggestions for follow-up are offered.

To learn more about the Climate Convenings Toolkit, visit:
https://climategen.org/resources/932/climate-convenings-toolkit/

Stories and storytelling are integral to the development of climate convenings. Here are some selected resources about storytelling you might find useful:

- Climate Generation. *It's Time to Talk Climate*. n.d. Retrieved from https://climategen.org/talk-climate/?utm_source=Climate+Generation&utm_campaign=2718136fa9-CLIMATEGEN_TALK-CLIMATE-DIGEST_2023-10-26&utm_medium=email&utm_term=0_4574e77afe-2718136fa9-260160525
- Climate Generation. *Discover Your Climate Story*. n.d. Retrieved from https://climategen.org/talk-climate/discover-your-climate-story/
- Climate Generation. *The Power of Climate Storytelling*. n.d. Retrieved from https://www.youtube.com/watch?v=CmYzry-rfTY&list=PLcNOW40d5rx177m6Bd7fpjPQ42fdL4aDm&index=6
- Climate Storytelling Lesson for the Classroom, https://climategen.org/resources/41988/climate-storytelling-lesson-for-the-classroom/

GUIDELINES IN PRACTICE

Program for Local Adaptation to Climate Effects: Sea Level Rise (PLACE: SLR)

In 2022, the Program for Local Adaptation to Climate Effects: Sea Level Rise (PLACE: SLR) kicked off our Community's RISE (Resilience in SLR Education) project focused on increasing community awareness of sea-level rise impacts along the Northern Gulf of Mexico. This two-year project enables residents, communities, and municipalities throughout the Gulf to understand and prepare for current and future flood risks and associated sea-level rise hazards.

The Community's RISE project supports enhanced resilience through a comprehensive approach, which brings Sea Level Rise education to different audiences within each community through three distinct pathways: SLR in the Classroom focuses on enhancing sea-level rise education through teacher training workshops; Community Connection Dialogues connect engaged residents with municipal officials working on flood resilience; and pop-ins engage informally with community members about sea-level rise. These three avenues are collectively part of a holistic strategy to engage new audiences and further enhance community resilience to sea-level rise and future flooding.

Sea-Level Rise in the Classroom

In 2022, our PLACE: SLR team completed the first leg of the Community's RISE project, a series of six Gulf-wide teacher workshops focused on Sea-Level Rise (SLR) in the Classroom. These workshops engaged with teachers and educators throughout the Gulf Coast and centered around integrating sea-level rise science, content, and activities into existing high-school science and social studies curriculum. These workshops were held in each of the five Gulf states (Texas, Louisiana, Mississippi, Alabama, and Florida) and included a full day of hands-on interactions with the SLR in the Classroom lessons and activities designed specifically to make sea-level rise education more accessible and engaging for students. The curriculum shared during our teacher workshops is free for teachers to use and can be found on our PLACE website.

continued on the following page

GUIDELINES IN PRACTICE

Program for Local Adaptation to Climate Effects: Sea Level Rise (PLACE: SLR)

Community Connection Dialogues

The second leg of Community's RISE is Community Connection Dialogues (CCDs), which are centered around connecting informed residents with their municipal officials and community leaders who are actively working on flood resilience projects or programs. Community Connection Dialogues are intended to be an informal discussion where residents are able to not only learn more about the science behind changing flood conditions but also have the opportunity to participate in educational activities, engage with other residents, ask questions, and get involved in future discussions surrounding future flood resilience in their own community.

No two Community Connection Dialogues are exactly the same. Depending on the community and their local needs, we'll discuss different resilience topics, partner with a variety of different local organizations, and talk about specific ways community members can participate in the next step towards resiliency in their community.

Our municipal partners have been city planners, floodplain managers, engineers, and resilience officers, all of whom are actively engaged in ongoing flood resilience projects in their municipalities. At each event, our municipal partners have an opportunity to highlight ongoing resilience activities and projects in the community and share information about how residents can stay updated and involved. So far, we've hosted events in Pensacola, Florida; Santa Rosa County, Florida; and Collier County, Florida. Next up, we're preparing for our next two Community Connection Dialogues in Mobile, Alabama, and Dixie County, Florida.

In addition to collaborating with a municipal partner for each Community Connection Dialogue, we partner with a community organization for each event. Community partners bring expertise in local engagement and outreach that is crucial in sustaining conversations and activities focused on flood resilience. Thus far, we've partnered with a variety of community partners from local nonprofits, environmental organizations, extension programs, and school groups. After the completion of each Community Connection Dialogue event, we continue working with our community organization partners with the final leg of Community's RISE, called pop-ins.

Pop-ins

Pop-ins are outreach events that are specifically designed to engage audiences that were not previously engaged in flood resilience. While Community Connection Dialogues are focused on engaged residents in the community who are already interested in flood resilience, pop-ins are intended to engage new audiences in new places.

Our PLACE team works with local community organizations and will co-host tabling events to train organization staff or volunteers on pop-in activities and information that present flood resilience in a fun and informal dialogue. Following the training, we'll give all the materials, supplies, activities, games, and information used for a pop-in to the community organization so they can continue engaging with audiences in the future and sustain messaging about sea-level rise and flood resilience.

Our PLACE team and our community partners conduct pop-ins at various events, from farmers' markets and craft fairs to places like Walmart parking lots.

Written by Andrew Medhurst, Coastal Resilience Specialist, PLACE: SLR.

For more information about PLACE: SLR, visit https://placeslr.org/

Key Characteristic #5:

Civic Engagement for Climate Action

Key Characteristic #5
Civic Engagement for Climate Action

Civic engagement includes a host of ways people work together to improve the quality of life in their community. Engagement can include caring for natural areas; providing information about climate change, and requesting that leaders, such as government, business, or nonprofit decision-makers, change policies. Educators can facilitate action projects with learners to make a difference in the community and build learners' skills and efficacy. Prioritizing collective action over individual action can engage learners in making more systemic and sustainable change, leading to greater feelings of efficacy and hope.

With community members and their partners, learners use their knowledge of climate processes and systems, familiarity with the community, and group process and problem-solving skills to design and implement climate action strategies for issues of their choosing. Learners understand that inclusive approaches to civic engagement increase their ability to develop successful collective action strategies that address climate impacts and climate justice concerns.

A. Investigate community climate concerns.

Educators support learners as they review evidence of local impacts and future projections of climate change, consider community perspectives about climate change, climate justice, and climate solutions, and select an issue or concern they want to address (e.g., community awareness, loss of biodiversity, food insecurity, neighborhood flooding).

Indicators:

- Apply their understanding of climate change, the community, and community perspectives about climate change, climate justice, and possible solutions to identify and describe issues or concerns to be investigated.
- Use a variety of sources and ways of knowing, including knowledgeable adults or peers, Indigenous Knowledge Systems, local knowledge, and peer-reviewed climate science, to research the relationship between climate change and an identified local issue or concern.
- Investigate the short- and long-term consequences of an identified issue on environmental quality and community well-being, with particular attention to implications for climate justice.
- Analyze differing perspectives that influence how people make climate change and climate justice decisions, including the perspectives of those who make the decisions.
- Reflect on how rules, laws, policies, and institutional decisions—including those made in the past (e.g., redlining, Clean Air Act)—impact their lives, the lives of others, environmental health, climate resilience, climate justice, and community well-being. Consider how laws and policies are made and enacted, including implications for climate justice, and how individuals such as themselves influence laws and policies.
- Work with community members and policy makers with expertise on the selected issue or concern to understand better what actions were taken in the past, what actions are planned, and what actions that could be taken in the community. For example, work with policy makers to learn about their perceptions of the selected issue or concern and what, if any, policies are in place or under consideration.
- Investigate how individual and collective actions can have cumulative effects, both in addressing climate impacts and creating just solutions.
- Apply research and analytical skills to determine whether action is needed on the identified issue or concern(s) and how learners could be involved.

• See **Resource #20,** page 166, to learn about community engagement and ownership, climate resilience planning, and EN-ROADS.

DID YOU KNOW?

Civic Engagement

Thomas Ehrlich[1] offered one of the most widely quoted definitions of civic engagement:

> *Civic engagement means working to make a difference in the civic life of our communities and developing the combination of knowledge, skills, values, and motivation to make that difference. It means promoting the quality of life in a community, through both political and non-political processes.*

Whether working individually or in groups, people's civic engagement can take many forms— volunteering on a habitat restoration project on public property, writing a letter to the editor about local air quality, or organizing a study circle to deliberate community responses to climate change. Civic engagement, especially engagement designed to improve community well-being, environmental sustainability, and climate resilience, requires individuals willing and able to act on their conclusions derived from shared visions and goals. Civic engagement is vital to democracy by supporting governance and political institutions. Communities with engaged citizens tend to be more resilient, more equitable, and more economically sound because of the heightened levels of social capital produced by people working together to improve their community.

Educators can provide opportunities for learners to gain skills for civic engagement and valuable experience in public governance. Due to the uncertainty around climate adaptation and mitigation actions, many community leaders are welcoming increased engagement from the public to help chart a course into the future.

If you want to learn more about civic engagement, there are excellent resources worth exploring:

- Ardoin, N. M., A. W. Bowers, and E. Gaillard. "A systematic mixed studies review of civic engagement outcomes in environmental education." Environmental Education Research, 29(1), 1-26. 2023. https://www.tandfonline.com/doi/full/10.1080/13504622.2022.2135688
- Glasser, D., R. Gupta, U. Thomas, and N. LaMarca. *CYCLIST: Literature Review on Youth Civic Leadership*. NewKnowledge Publication #IML.052.488.01, New York: New Knowledge Organization Ltd. 2019. Retrieved from https://afterschoolalliance.s3.amazonaws.com/documents/CYCLIST_Toolkit_Final_Oct28.pdf
- Stanford University and NAAEE. *Stanford University Review of 56 Studies Reveals That Environmental Education Programs Achieve Substantial Civic Engagement-Related Outcomes at the Individual and Community Levels*. eeWorks. 2024. Retrieved from https://naaee.org/programs/eeworks
- Stanford University and NAAEE. *Environmental Education Practices That Support Civic Engagement*. eeWorks. 2024. Retrieved from https://naaee.org/programs/eeworks
- The Policy Circle. *Civic Engagement*. 2023. Retrieved from https://www.thepolicycircle.org/brief/whats-whys-civic-engagement/
- Tufts University. Center for Information and Research on Civic Learning and Engagement (CIRCLE). *What is Civic Engagement?* 2023. Retrieved from https://circle.tufts.edu/understanding-youth-civic-engagement/what-it
- University of Michigan. Edward Ginsberg Center. *Civic and Democratic Engagement: A Brief Overview*. 2023. Retrieved from https://ginsberg.umich.edu/article/civic-and-democratic-engagement-brief-overview
- Youth.Gov. *Civic Engagement*. n.d. Retrieved from https://youth.gov/youth-topics/civic-engagement-and-volunteering

[1] Ehrlich, T. The Definition of Civic engagement. New York Times. 2000. Retrieved from https://archive.nytimes.com/www.nytimes.com/ref/college/collegespecial2/coll_aascu_defi.html?pagewanted=print

Collective Environmental Literacy

Collective environmental literacy recognizes that no individual has all the answers; rather, knowledge is distributed and shared among many people. By pooling their collective knowledge, groups and communities can work together to solve problems, make better decisions, and innovate more effectively.

NOAA's Office of Education's theory of change recognizes collective environmental literacy as foundational to the development of community resilience. Their theory of change describes "the conceptual framework for the ways in which community resilience education can lead to increased community engagement and civic action, ultimately leading to a healthier, more resilient, and equitable society." It establishes the development of collective environmental literacy as their primary Environmental Literacy Program (ELP) Goal: (p 51)

> *Communities have sufficient collective environmental literacy to take actions that build resilience to extreme weather, climate change, and other environmental hazards in ways that contribute to community health, social cohesion, and socio-economic equity. These communities are composed of individuals who participate in formal and informal education experiences that develop their knowledge, skills, and confidence to:*
>
> – *Reason about the ways that human and natural systems interact globally and locally, including the acknowledgment of disproportionately distributed vulnerabilities;*
> – *Participate in civic processes; and*
> – *Incorporate scientific information, cultural knowledge, and diverse community values in decision-making.*

Bey, G., C. McDougall, and S. Schoedinger. *Report on the NOAA Office of Education Environmental Literacy Program Community Resilience Education Theory of Change*. National Oceanic and Atmospheric Administration, Washington, DC. 2020. Retrieved from https://www.noaa.gov/education/explainers/noaas-community-resilience-education-theory-of-change

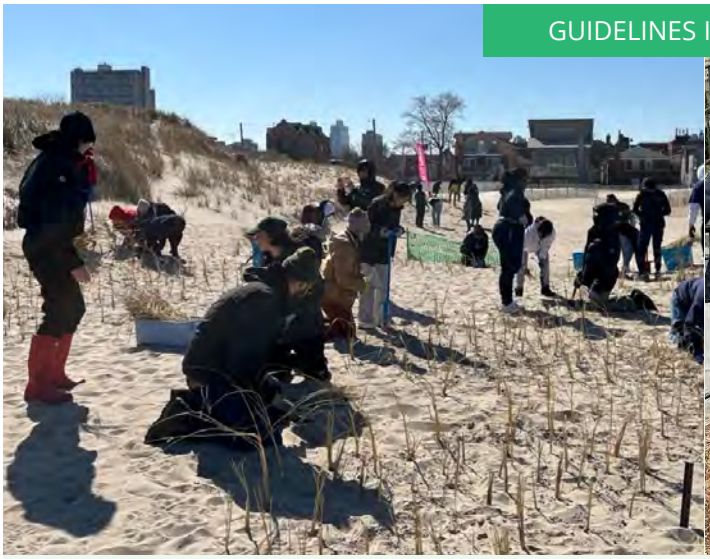
B. Select a civic action goal and plan a strategy for achieving it

Educators support learners as they work collaboratively with their partners to build collective awareness and understanding of climate solutions and possible action strategies for their identified issue. Learners critique alternative solutions and courses of action and determine how they and their partners will decide which action strategies to pursue.

Indicators:

- Research examples of local and regional climate action successes, including examples of community resilience practices, community science programs, climate policy, and climate-related career initiatives. Listen to, learn from, and elevate community members who have enacted climate solutions, particularly those from communities with climate justice concerns. Generate collaborative messages of hope.
- With partners and collaborators, determine how group decisions about action planning and project implementation will be made (e.g., consensus, voting).
- With partners and collaborators, evaluate the spectrum of local civic action strategies (e.g., environmental restoration, school energy efficiency, community education, community policy) that might apply to their selected issue or concern. Consider local actions to address local challenges to mitigate or adapt to climate change.
- Identify opportunities to address multiple issues (e.g., climate change, food insecurity) by working within a system. For example, learners involved with a climate action project on food waste might gather food from local farms and distribute it through the school's backpack program for food-insecure families.
- Investigate the short- and long-term consequences of potential action strategies. For example, if learners propose a shift away from fossil fuels, identify actions that support workers and other community sectors (e.g., business, industry) affected by the change and consider how to ensure this transition benefits the whole community.
- Explore evidence-based climate solutions, such as those presented by Project Drawdown and EN-ROADS. Identify and propose action strategies, including strategies designed to impact climate policy, and evaluate their likely effectiveness given the community's specific environmental, cultural/social, political, and economic context.
- Collect information about and analyze how proposed action strategies might affect different groups of people, including policy-makers. Consider possible implications for climate justice.
- Based on their interests, research, and analysis of environmental and community issues, learners develop an action plan that includes actions designed to impact policy, such as speaking to key decision-makers, working with the media, meeting with interest groups, or educating community members. Generate a list of tasks and a timeline.

GUIDELINES IN PRACTICE



Mitigating RiSC: Creating Resilient Schools and Communities

The National Wildlife Federation's Resilient Schools and Communities (RiSC) program educates New York City middle and high school youth about climate science, climate impacts, climate justice, and the natural and built solutions that increase climate resiliency. One example includes New York Harbor boat trips where students learn about coastal flooding and urban infrastructure from a unique vantage point—on the water. Another example includes tree-planting projects on school campuses after learning about urban heat islands and the heat-mitigating power of trees. RiSC provides access to a curriculum that couples risk assessment with hands-on restoration projects that mitigate the impacts of extreme weather at the local level.

In 2020, RiSC expanded its restoration investigations to the frontline community of Coney Island. This fragile coastal community continues to experience lasting impacts from Superstorm Sandy (2012), including the environmental risks of sea level rise and erosion. RiSC's restoration activities in Coney Island Creek Park have engaged students and community partners in planting nearly 40,000 beach grass stems to the bare and transient dunes. The beach grass stabilizes the dunes, provides a natural buffer against storm surge, and offers protection from residential flooding. The dune restoration results are immediate, tangible, and connected to a nationwide tragedy still felt in the local community. They can't plan future plantings fast enough.

Coney Island resident Abby Jordan, RiSC program advisor and team leader at Liberation Diploma Plus High School, reflects on the RiSC experience, "The opportunity to work on environmental justice and coastal resiliency projects in their native Coney Island empowers [my students] to continue asking questions and advocating for change. From beach grass planting to oral history interviews, … we now have a group of talented young folk who confidently say they know how to revegetate dunes and talk to community members about climate change and coastal resilience."

In under a decade, RiSC has served dozens of New York City schools, expanded to five New Jersey schools, two Puerto Rico schools, and several Texas schools, engaged thousands of students, and provided professional development to hundreds of teachers.

continued on the following page

GUIDELINES IN PRACTICE

Mitigating RiSC: Creating Resilient Schools and Communities

Why RiSC Works:

- A supporting curriculum helps youth understand the fundamentals of climate science and extreme weather risks. An accompanying RiSC Vulnerability Assessment supports students to evaluate their schools' and neighborhoods' vulnerability to these risks. The RiSC curriculum identifies community risks, supports local nature-based solutions, and prepares participating teachers through professional development workshops.
- The RiSC program creates opportunities for meaningful interactions with community members, resilience practitioners, and decision-makers in New York City. "Centering the voices of community partners and local resident advisors has led to the creation of a program curriculum that is focused on issues facing the Coney Island community, specifically climate impacts, socio-economic conditions, development pressures, and inadequate resiliency plans," says Emily Fano, RiSC senior program manager.

RiSC was the recipient of the Federal Emergency Management Agency's (FEMA) 2023 Cooperative Technical Partners Recognition Program Award for "outstanding efforts to increase risk awareness [and] help advance equity and inclusion." RiSC's role aligns with FEMA's strategic priorities to increase climate literacy and engage communities in becoming resilient to both natural and human-generated catastrophic risk. The RiSC program has already been adapted in Texas, New Jersey, the U.S. Virgin Islands, and Puerto Rico. NOAA, FEMA, and EJ4Climate grant funds have supported the expansion and adaptation of the RiSC program.

To learn more about RiSC:

- RiSC website: www.riscnyc.org
- RiSC Curriculum: https://www.riscnyc.org/curriculum-1
- RiSC Instagram: @riscnyc1
- Video: https://scienceline.org/2023/05/nyc-students-make-shore-coney-island-safe-from-storms-by-planting-grasses/
- FEMA Award Press Release: https://www.nwf.org/Latest-News/Press-Releases/2023/5-12-23-NYCRISC-Presented-With-FEMA-Award
- National Wildlife Federation: https://nwf.org/

What do you need to solve the climate crisis? The answer is, everyone.

— Katharine Hayhoe, Author, ***Saving Us: A Climate Scientist's Case for Hope and Healing in a Divided World***


Photo: Preston Keres/USDA/FPAC

C. Take action on selected climate issue(s) and concern(s)

Educators provide opportunities for learners to plan action-taking strategies and participate in individual and collective climate action of their own choosing.

Indicators:

- Create criteria for gauging the effectiveness of proposed climate action strategies. Apply the criteria to proposed climate actions before launching the action or project.
- Develop the capacity to implement climate actions by practicing applicable skills, including group process, group decision-making, communication, listening, and negotiation skills.
- Clearly communicate the goals and expected outcomes of the proposed action strategy.
- Identify and remove barriers that prevent individuals and groups, including communities with climate justice concerns, from taking action. For example, confirm that accommodations are available for people with childcare needs, transportation needs, differing physical abilities (e.g., mobility, hearing, vision), and those from various language groups and religious traditions.
- Implement climate action strategies of their choosing and design, with the support of educators, partners, and community members.
- Mobilize partners and collaborators to participate in outreach related to the action-taking efforts.
- Work with partners and community members to modify the action plan throughout the process to ensure success. Be persistent, recognizing that policy change rarely happens based on a single interaction.

• See **Resource #21,** page 173, to learn about youth-led community impact projects, environmental action civics, and Community Action Projects for the Environment (CAPE).

D. Celebrate and share progress toward becoming a thriving community

Educators support learners and their partners as they amplify and elevate their success.

Indicators:

- Assess the impact of the learners' action strategy. Reflect on the effects of their climate actions, consider unintended consequences, and weigh what, if anything, they would do differently. Identify and highlight progress toward just climate solutions in the community and elsewhere.
- Reflect on what learners gained from planning and implementing an action strategy. Frame successes as learning opportunities for replication and scaffolding for the next step.
- Recognize the actions of others and demonstrate appreciation for how these actions are part of a larger movement.
- Use media outlets to share and celebrate success at various scales, including local, regional, tribal, national, and global levels.
- Recognize how learners' actions contribute to a shared vision of sustainability, climate resilience, climate justice, and hope in their community.
- Celebrate champions and leaders (including youth and members of communities with climate justice concerns) of climate change action and climate justice. Use inspirational stories to encourage a commitment to individual and collective climate action.
- Tell the story of your action project and celebrate collaborators and partners.

DID YOU KNOW?

Acknowledging Small Acts by Young People

Children are constantly learning about right and wrong and what is and isn't appreciated by others. As they go about their days, they act in small ways that can impact the environment and others. Acknowledging these small acts is not only kind but also reinforces the power of their behaviors. The following are some suggested ways of acknowledging children's small acts.

Children 0-3

- Thank you for picking up that trash; it helps keep our neighborhood clean.
- I noticed you put that banana peel in the compost; thank you for taking care of the planet.
- You have planted so many seeds today! Thank you for taking care of our garden; the butterflies and bees will really benefit from your work.
- Thank you for putting that rock back in the stream; those fish like to use that space for laying eggs. You are very good at taking care of the planet.

Children 3-5

- Thank you for turning off the light; it helps us use less energy and helps the planet.
- You picked up that caterpillar so gently; I can tell that you really care about nature.
- The art you made for our windows prevents birds from flying into them. It has made a difference. Thank you for caring about the planet.

Children 5 and older

- I heard you told your parents about our recycling project at school. I can see that you really care about the planet and are working hard to protect it.
- Today, you wrote a letter to the principal to advocate for a new school garden. Thank you for thinking about the planet.
- Sometimes, walking or riding your bike to school can be hard. I appreciate your thinking about our planet and caring for our community.
- You finished that birdfeeder. That will make a difference for birds finding food in our community. Thank you for thinking about the planet.

Morris Area Rural Citizen Dialogues

Rural communities are at risk of being seriously affected by climate change. Extreme weather in communities such as Morris, Minnesota, has caused unease about how to tackle climate change now and in the future. Rural economies are not only vulnerable to extreme weather events but also to policy changes that are intended to address climate change. Policies that raise resource and energy costs, for example, adversely affect residents in rural areas who, on average, spend a greater percentage of their income on energy costs compared to national averages.

Climate Dialogues

Climate Dialogues are designed to help rural communities come together to think critically and strategically to address local climate change. The Morris Climate Dialogue was the first of many projects in Minnesota, organized by the Jefferson Center, aimed at stimulating rural residents to work together and tackle climate change.

The Climate Dialogues used the Citizens' jury method to ensure effective engagement and community problem-solving. A Citizens' Jury is an intensive participatory process that brings together a group of randomly selected community members to deliberate on an issue. Over a period of days, the selected community members are exposed to an issue and hear from a wide range of witnesses and experts. Trained moderators overlook the process to ensure the proceedings are fair. The jurors examine the witnesses and can even call for more information if necessary. The jurors use deliberation to come up with an action plan. The sponsoring body is often required to act on the report.

Morris Area Climate Dialogues

Fifteen randomly selected Stevens County residents met for three days at the West Central Research and Outreach Centre in Morris, Minnesota. Participants arrived at the Centre at 8:30 AM and stayed until 5:00 PM. The group of fifteen were tasked with deciding how the Morris Area might combat climate change.

On day one, participants were introduced to each other and began discussing goals and expectations for the three days. They engaged in a simulation exercise to get them working together. Prior to their first formal

continued on the following page

GUIDELINES IN PRACTICE

Morris Area Rural Citizen Dialogues

presentation, participants identified factors related to community resilience. Their first presentation was on local extreme weather and climate conditions. Before day one concluded, the participants discussed key weather and climate facts from the presentation.

Day two commenced with a presentation by the Centre for Earth, Energy & Democracy on energy burdens. After the presentation, participants discussed community concerns related to energy use and poverty. Additionally, participants listened to five presentations focusing on (1) extreme weather and insurance, (2) climate and agriculture, (3) local infrastructure concerns, (4) energy and energy efficiency, and (5) options to strengthen resilience.

Day three convened with the participants identifying top challenges, opportunities, key facts, implications, and actions. Finally, the participants wrote a report outlining their recommendations for community action:

1. Assess and adapt agricultural practices to ensure future productivity in the face of extreme weather and climate change.
2. Embrace new technology to improve individual and community resilience in response to climate change and increases in insurance and energy costs.
3. Plan for heavy precipitation events and implement new methods to protect private property, improve water quality, and ensure a sufficient water supply for now and the future.
4. Educate community members on the concerns, opportunities, and actions identified with rural climate change.
5. Ensure the whole community is mindful of local weather and climate change and can voice their concerns.

Since the Citizens' Jury ended, local partners obtained over $50,000 in supplementary funding to implement recommendations. Throughout Morris City, new collaborations between the local government, nonprofits, academic institutions, and community members emerged. State agencies and other institutions are incorporating the recommendations from the dialogues into their work.

The Morris City Council has signed a technical assistance agreement with sister city Saerback, Germany, to seek the arrangement of clean energy technology to promote economic development and to reduce greenhouse emissions. Morris City made improvements in energy efficiency to city-owned buildings and street lighting. Stevens County integrated climate resilience into its emergency and disaster plans. Community awareness of climate change is being promoted through discussions, K–12 students, and green tours of clean energy sites. The University of Minnesota–Morris has dedicated students and staff to hold community education events on climate change. Consequently, the University won the 2017 Minnesota Climate Adaptation Award for successfully promoting the "Morris Model" for climate adaptation planning and creating public awareness.

The success of the Morris Area Rural Climate Dialogues indicates that a small, diverse group of community members, educated by experts and focused on producing a plan of action that a community can agree on, can be extremely useful for engaging on a complex issue such as climate change.

To learn more about the Morris Area Rural Climate Dialogues, visit https://jefferson-center.org/rural-climate-dialogue-morris/

This case study is adapted from "Morris Area Rural Climate Dialogues" (https://participedia.net/case/5107) by Patrick L. Scully, Scott Fletcher Bowlsby, and Annie Pottorff (https://participedia.net/user/25).

RESOURCES YOU CAN USE

eePRO

eePRO is NAAEE's online platform for environmental education professional development, offering a searchable bank of resources (lesson plans, journal articles, reports, videos), a listing of learning opportunities (webinars, on-line courses, workshops, conferences), a higher education database, and much more.

eeBLUE

Stories and case studies from eeBLUE—a partnership between NOAA and NAAEE to increase environmental and science literacy

eePRO Groups

A discussion platform where individuals can join special interest groups, network, and discuss key issues related to environmental education

eeLEARN

A series of online learning modules exploring the foundations of environmental education

eeNEWS

A biweekly e-newsletter, providing the latest news, opportunities, and resources for the environmental education community

eeRESEARCH

A searchable library of research summaries and syntheses focusing on environmental education and connecting people to nature.

eeWORKS

Research reviews and tools for illustrating the value and impacts of environmental education

PRO Picks

A curated listing of educational resources recommended by experts in environmental education

Access all these eePRO resources by visiting https://naaee.org/eepro

RESOURCES YOU CAN USE

The National Project for Excellence in Environmental Education

The North American Association for Environmental Education (NAAEE) launched the National Project for Excellence in Environmental Education to help educators develop and deliver high-quality education programming. The project works to create more environmentally literate community members with the knowledge, skills, and inclinations to make informed choices and exercise the rights and responsibilities of members of a community.

NAAEE has published seven sets of guidelines that promote the use of balanced, scientifically accurate, and comprehensive environmental education materials and programs that advance environmental literacy and civic engagement. Publications created by the National Project for Excellence in Environmental Education include:

K–12 Environmental Education: Guidelines for Excellence (2019). A comprehensive framework for environmental education, demonstrating benchmarks towards environmental literacy.

Environmental Education Materials: Guidelines for Excellence (2021). A set of recommendations for developing and selecting environmental education instructional materials.

Professional Development of Environmental Educators: Guidelines for Excellence (2019). A set of competencies for educators preparing to teach environmental education in a variety of settings.

Environmental Education Programs: Guidelines for Excellence (2022). A set of recommendations to be used in the development of comprehensive environmental education programs or to inform improvements in existing ones.

Early Childhood Environmental Education Programs: Guidelines for Excellence (2016). A set of recommendations to be used in the development of comprehensive early childhood environmental education programs or to trigger improvements in existing ones.

Community Engagement: Guidelines for Excellence (2017). A set of guidelines focused on community wellness and designed to help environmental educators create inclusive environments that support effective partnerships and collaborations.

Educating for Climate Action and Justice: Guidelines for Excellence (2024). A set of guidelines designed to assist educators in developing and implementing effective programs that focus on climate change, address injustice, and ignite action.

You can download free pdfs of these publications or purchase hard copies from NAAEE at https://eepro.naaee.org/resource/guidelines-excellence-series

Supporting Resources

Photo: Alaska Center for Energy

Supporting Resources

This collection of resources is designed to augment the guidelines, providing background information so you can dive more deeply into aspects of climate education that may be unfamiliar. You will see links from specific sections in the guidelines to these resources. Navigate back and forth between the guidelines and the resources, as you explore ideas for designing education for climate action and justice.

- Resource #1 Great Resources for Climate Change Basics
- Resource #2 Climate Change and Human Health
- Resource #3 Climate Change Solutions
- Resource #4 Principles of Environmental Justice and Climate Justice
- Resource #5 Climate Justice: Who is at Risk and Why?
- Resource #6 Climate Change Research and Policy Reports and Additional Case Studies Supporting Climate Action and Justice
- Resource #7 Elements of Effective Climate Change Education
- Resource #8 Teaching Young Children: Developmentally Appropriate Practice
- Resource #9 Features of Positive Youth Development
- Resource #10 Reliable Sources
- Resource #11 Environmental Education Learning Frameworks
- Resource #12 Using Science Investigation to Develop Caring Practices for Social-Ecological Systems
- Resource #13 Talking with Children about Climate Change
- Resource #14 Great Climate Change Resource Guides
- Resource #16 Climate Mental Health
- Resource #15 Tips for Addressing Climate Anxiety in Youth
- Resource #16 Balancing Hope and Threats
- Resource #17 Fundamental Best Practices for Community Engagement
- Resource #18 Tools for Identifying Local Environmental Impacts
- Resource #19 Using Local Phenomena to Communicate Climate Solutions
- Resource #20 Community Engagement and Ownership
- Resource #21 Youth-Led Community Impact Projects

Resource #1

Great Resources for Climate Change Basics

If you want to learn more about climate change, there are many excellent resources worth exploring:

- **Fifth National Climate Assessment.** November 2023, https://nca2023.globalchange.gov
  The Fifth National Climate Assessment (NCA5) is a comprehensive report conducted and published by the United States Global Change Research Program (USGCRP). The report is produced every four years and provides a scientific assessment of the current state of climate change impacts and risks across the United States. It involves the collaboration of hundreds of experts from various scientific and governmental institutions, and it serves as a critical resource for policymakers, businesses, and the public to understand the implications of climate change on various sectors of society.

  NCA5 includes information on observed and projected changes in temperature, precipitation, sea-level rise, and other climate-related factors. It also assesses the impacts of climate change on ecosystems, human health, infrastructure, agriculture, water resources, and more. Additionally, the report highlights potential future scenarios based on different greenhouse gas emissions trajectories and the associated risks and vulnerabilities.

- **Intergovernmental Panel on Climate Change (IPCC).** Sixth Assessment. 2023, https://www.ipcc.ch/report/sixth-assessment-report-cycle/
  The Intergovernmental Panel on Climate Change (IPCC) is a scientific body established by the United Nations (UN) in 1988 to provide policymakers with objective, up-to-date, and comprehensive information on climate change. The IPCC does not conduct original research but instead reviews and assesses the existing scientific literature related to climate change.

  The Sixth Assessment Report, published in 2023, provides a comprehensive and authoritative review of the current scientific knowledge on climate change. Each Assessment Report goes through a rigorous review process and involves the contributions of thousands of scientists and experts worldwide. The reports summarize the state of knowledge on climate change, its impacts, potential adaptation and mitigation strategies, and the role of human activities in driving climate change.

- **NASA Global Climate Change—Vital Signs of the Planet,** https://climate.nasa.gov/
  NASA Global Climate Change offers a dashboard of global vital signs—changes in carbon dioxide, global temperature, methane, arctic sea ice, ice sheets, sea level, and ocean warming. You will also find research-based information on various topics, including the causes and effects of climate change and possible solutions.
- **NASA Earth Observatory,** https://earthobservatory.nasa.gov/
  Established in 1999 as part of the NASA's Earth Science Division, the Earth Observatory provides the public with access to comprehensive and up-to-date information about Earth's environment. It bridges the scientific community and the public, offering a wide range of visually compelling content that highlights Earth science research, discoveries, and observations made by NASA satellites and other instruments. The Earth Observatory's website features images, articles, data visualizations, and educational resources.
- **NOAA Climate.gov,** https://www.climate.gov
  Climate.gov, operated by the National Oceanic and Atmospheric Administration (NOAA), is a source of authoritative and up-to-date information about climate science, data, and climate-related events. The website provides interactive maps, data visualizations, articles, and educational materials to help the public understand climate-related topics and their impacts.
- **U.S. Climate Resilience Toolkit,** https://toolkit.climate.gov/
  The U.S. Climate Resilience Toolkit (CRT) is an online resource that helps planners and the public learn about the impacts of climate change in their communities. The toolkit includes a guide to the Steps to Resilience, access to reports and state-level climate information, a portal to over 500 online tools for managing climate-related risks and opportunities, and region-specific assessments.

Resource #2

Climate Change and Human Health

According to the CDC:

> *Climate change, together with other natural and human-made health stressors, influences human health and disease in numerous ways. Some existing health threats will intensify, and new health threats will emerge. Not everyone is equally at risk. Important considerations include age, economic resources, and location.*
>
> *In the United States, public health can be affected by disruptions of physical, biological, and ecological systems, including disturbances originating here and elsewhere. The health effects of these disruptions include increased respiratory and cardiovascular disease, injuries and premature deaths related to extreme weather events, changes in the prevalence and geographical distribution of food- and water-borne illnesses and other infectious diseases, and threats to mental health.*

Source: CDC. Climate Effects on Health. Centers for Disease Control and Prevention. 2022. Retrieved from https://www.cdc.gov/climateandhealth/effects/default.htm

To learn more about the relationship between climate change and human health, you may want to explore some of the following resources:

- CDC. *Justice, Equity, Diversity, and Inclusion in Climate Adaptation Planning*. Centers for Disease Control and Prevention. April 2022. Retrieved from https://www.cdc.gov/climateandhealth/JEDI.htm
- CDC. *Preparing for the Regional Health Impacts of Climate Change in the United States*. Centers for Disease Control and Prevention. July 2020. Retrieved from https://www.cdc.gov/climateandhealth/docs/Health_Impacts_Climate_Change-508_final.pdf
- Clayton, S., C.M. Manning, M. Speiser, and A.N. Hill. *Mental Health and Our Changing Climate: Impacts, Inequities, Responses.* Washington, DC: American Psychological Association, and ecoAmerica. 2021. Retrieved from https://ecoamerica.org/wp-content/uploads/2021/11/mental-health-climate-change-2021-ea-apa.pdf
- EPA. *Climate Change and Children's Health and Well-Being in the United States*. U.S. Environmental Protection Agency, EPA 430-R-23-001. 2023. Retrieved from https://www.epa.gov/system/files/documents/2023-04/CLiME_Final%20Report.pdf
- USGCRP. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. [Crimmins, A., J. Balbus, J.L. Gamble, C.B. Beard, J.E. Bell, D. Dodgen, R.J. Eisen, N. Fann, M.D. Hawkins, S.C. Herring, L. Jantarasami, D.M. Mills, S. Saha, M.C. Sarofim, J. Trtanj, and L. Ziska, Eds.] U.S. Global Change Research Program, Washington, DC, 312 pp. 2016. Retrieved from https://health2016.globalchange.gov/high/ClimateHealth2016_FullReport.pdf

GUIDELINES IN PRACTICE

Houston Youth Digging in to Protect Their Communities from Flooding

What does the health of my watershed have to do with resilience to climate change? The National Wildlife Federation's Student Climate Resilience Ambassadors (SCRA) are Houston high school students who use a project-based learning approach to answer this question and to take action to protect their schools and communities from flooding.

> *Empowering students to analyze their campus and make decisions that directly impacted our campus was truly rewarding. Students loved assessing their campus and then choosing a type of project and location to minimize flooding. Students asked, " Are we really going to build this on our campus?!?!" Because of this program, I could say YES! The students really felt like they had ownership over the program, and several students said it was their favorite project all year.*
>
> **— Jess Merino, Former Teacher, Energy Institute High School**

Severe weather events, like the crippling flooding caused by Hurricane Harvey, put a spotlight on the enormous climate resilience challenges facing the city of Houston, where even three inches of rainfall can overwhelm the drainage systems and contribute to flooding. The most vulnerable communities typically bear the heaviest destruction in these types of disasters. The economic and emotional hardship of families in Houston Independent School District (HISD), where 78% of the student population is economically disadvantaged and 88% are people of color, was huge. The National Wildlife Federation developed the SCRA program to help address these challenges.

The National Wildlife Federation is working closely with local Houston partners, including the Houston Parks and Recreation Department, Galveston Bay Foundation, the Student Conservation Association, and TBG Partners Houston, to help Houston youth understand how a changing climate, severe weather events, watershed health, and existing infrastructure contribute to flooding and polluted water in their community.

Along with the National Wildlife Federation's watershed audit, students use mapping tools such as the National Oceanic and Atmospheric Administration's (NOAA) coastal flood exposure mapper, Harris County flood maps, and critical thinking skills to investigate Houston's storm resilience problems.

GUIDELINES IN PRACTICE

Houston Youth Digging in to Protect Their Communities from Flooding

They learn about the impact of these issues on vulnerable populations and design and implement nature-based, practical solutions to help mitigate flooding on their school campus. These projects include rain gardens, pocket prairies, and bioswales—designs that communities can replicate.

Students also participate in tree or prairie planting at a community action day along a local bayou, which helps them see how their work on campus contributes to Houston's resilience strategy.

The most rewarding thing about the SCRA program was learning about Houston's resiliency able to equip students with the appropriate knowledge and vocabulary so they may engage in dialogue about their community.

— Talia Camacho, Teacher, Northside High School

Student Climate Resilience Ambassadors also learn that an important part of watershed stewardship is understanding how watersheds are connected and how our actions in one watershed impact other watersheds and ecosystems downstream, specifically Galveston Bay. Galveston Bay is Texas's largest and most productive estuary, where fresh water from the Trinity and San Jacinto rivers and the extensive bayous and creeks of the Houston-Galveston region mix with the saltwater of the Gulf of Mexico.

The Student Climate Resilience Ambassadors program was initially funded by the EPA, with additional funding from H-E-B supermarket, the Alkek Foundation, the Duncan Fund, and the Powell Foundation. In its third year, the SCRA program has engaged 12 secondary schools in Houston ISD.

IMPACT BY THE NUMBERS

800 students, **30** teachers | **7** campus resilience projects | **1** pocket prairie, **4** rain gardens, **2** bioswales | **6** community action days along **3.5** acres of Sims, Buffalo, and Greens Bayous | **3,500** native prairie plants | **500** native trees

Written by Marya Fowler, Director of Education and Outreach at National Wildlife Federation, South Central Region

Learn more about NWF's work in Houston! To learn more about the National Wildlife Federation's education program in the South Central Region, visit: https://www.nwf.org/South-Central-Region/South-Central-Education?_gl=1*13fjdrf*_ga*MjEyMTkyNDM5Ni4xNjg4NDIzODYw*_ga RLRJ1GMJC2*MTY5MDkyODQ5MS40LjAuMTY5MDkyODQ5MS42MC4wLjA.

Photos: https://blog.nwf.org/2022/03/houston-youth-digging-in-to-protect-their-communities-from-flooding/

Resource #3

Climate Change Solutions

Climate solutions that we can implement at every level—local, state/provincial, tribal, national, and global—exist now. We know how to mitigate and adapt to climate change. We know how to build climate-resilient communities. The Drawdown Framework for Climate Solutions provides recommended solutions that fall into three broad areas of action.

- **Reduce Sources, bringing emissions to zero.**
  Shift how energy is produced and consumed by transitioning away from activities that release greenhouse gas emissions across sectors, ultimately bringing these emissions down to zero. This transition involves replacing fossil fuel-based energy sources with sustainable and renewable alternatives.

- **Support Sinks, uplifting nature's carbon cycle.**
  Encourage actions that enhance the Earth's natural ability to absorb and store carbon dioxide. Measures may include reforestation, protecting existing forests that act as vital carbon reservoirs, and implementing practices that promote healthy soil, such as regenerative agriculture that increases carbon sequestration.

- **Improve Society, fostering equality for all.**
  Address social issues as part of the broader effort to combat climate change. This recommendation recognizes that promoting equality and social justice is integral to building a sustainable and resilient future. By ensuring that everyone has access to education, healthcare, and economic opportunities, societies can become more resilient to the impacts of climate change.

Source: Project Drawdown. Climate Solutions. 2023. Retrieved from https://drawdown.org/drawdown-foundations

To learn more about climate solutions, you may want to explore some of the following resources:

- All We Can Save Project. n.d. Retrieved from https://www.allwecansave.earth/
- Carpenter, J. *Three Steps to Cut Your Carbon Footprint 60% Today.* TEDxAsheville. 2017. Retrieved from https://www.youtube.com/watch?v=63hAHbkzJG4
- Hawken, P. *Regeneration: Ending the Climate Crisis in One Generation.* 2021. Penguin Books.
  IPCC, 2023: Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II, and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 1-34, https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf
- Johnson, A.E. and K. Wilkinson (eds.) *All We Can Save.* One World. 2020.
- Stein, B. A., et al. Innovation in Climate Adaptation: Harnessing Innovation for Effective Biodiversity and Ecosystem Adaptation. Washington, DC: National Wildlife Federation. 2024. Retrieved from https://www.nwf.org/-/media/Documents/PDFs/NWF-Reports/2024/Innovation-in-Climate-Adaptation.pdf
- Tolley, M. *How To Reduce Your Carbon Footprint By 80%.* TEDxTelford. 2020. Retrieved from https://www.youtube.com/watch?v=6r06-dpRsEg
- UNEP. *The Six-Sector Solution to the Climate Crisis.* 2020. Retrieved from https://www.unep.org/interactive/six-sector-solution-climate-change/
- Wilkinson, K. et al. *The Drawdown Review: Climate Solutions for a New Decade.* 2020. Retrieved from https://drawdown.org/sites/default/files/pdfs/TheDrawdownReview%E2%80%932020%E2%80%93Download.pdf

Resource #4

Principles of Environmental Justice and Climate Justice

Over the decades, groups came together first to propose principles of environmental justice and later, principles of climate justice that call for fair and equitable solutions to environmental concerns and climate change impacts. These principles consider the needs and rights of disproportionately impacted communities while addressing the root causes of climate change. They serve as frameworks to guide policymakers' and societal responses to environmental impacts. The principles have become essential to international climate negotiations, guiding efforts to tackle climate change in a more inclusive, fair, and just manner.

The Mary Robinson Foundation for Climate Justice outlines seven principles of climate justice:[1]

- Respect and Protect Human Rights
- Support the Right to Development
- Share Benefits and Burdens Equitably
- Ensure that Decisions on Climate Change are Participatory, Transparent and Accountable
- Highlight Gender Equality and Equity
- Harness the Transformative Power of Education for Climate Stewardship
- Use Effective Partnerships to Secure Climate Justice

If you want to learn more about environmental justice and climate justice principles, here are some additional resources worth exploring.

• *Bali Principles of Climate Justice.* August 29, 2002. Retrieved from https://www.ejnet.org/ej/bali.pdf
• Climate Justice Alliance. *Just Transition Principles.* n.d. Retrieved from https://climatejusticealliance.org/wp-content/uploads/2019/11/CJA_JustTransition_highres.pdf
• First National People of Color Environmental Leadership Summit. *Principles of Environmental Justice.* October 1991. Retrieved from https://www.ejnet.org/ej/principles.pdf
• Global Forest Coalition. *COP27 Peoples' Declaration for Climate Justice.* November 2022. Retrieved from https://globalforestcoalition.org/cop27-peoples-declaration-for-climate-justice/#:~:text=We%2C%20the%20people%2C%20declare%20for,a%20life%20and%20death%20fight
• Mary Robinson Foundation Climate Justice. *Declaration on Climate Justice.* 2013. Retrieved from https://www.mrfcj.org/media/pdf/Declaration-on-Climate-Justice.pdf
• School of Natural Resources and Environment, University of Michigan. Environmental Justice Initiative. *The Climate Justice Declaration.* 2004. Retrieved from http://websites.umich.edu/~snre492/cgi-data/ejcc_principles.html
• WeAct for Environmental Justice, Environmental Justice Leadership Forum on Climate Change. *Principles of Climate Justice.* 2009. Retrieved from https://www.ejnet.org/ej/ejlf.pdf

[1] Mary Robinson Foundation Climate Justice. Declaration on Climate Justice. 2013. Retrieved from https://www.mrfcj.org/media/pdf/Declaration-on-Climate-Justice.pdf

Resource #5

Climate Justice: Who is at Risk and Why?

We know that climate change impacts everyone to some extent. We also know that climate change consequences are unevenly distributed across communities, regions, and the world—even within a single community, the consequences of climate change can differ among neighborhoods and individuals. Understanding who is most at risk from climate impacts and why risks differ can aid us in developing effective climate actions.

If you want to learn about who is most at risk from climate impacts, here are some resources worth exploring.

- Deaton, D. *Environmental Justice Practices & Resources for Rural Communities*. Aspen Institute. 2022. Retrieved from https://www.aspeninstitute.org/blog-posts/rural-environmental-justice/
- EPA, Climate Change Impacts. *Climate Change and Human Health: Who's Most at Risk?* 2023. Retrieved from https://www.epa.gov/climateimpacts/climate-change-and-human-health-whos-most-risk
- EPA. *Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts*. September 2021. Retrieved from https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability_september-2021_508.pdf
- EPA. C*limate Change and Children's Health and Well-being in the United States*. April 2023. Retrieved from https://www.epa.gov/system/files/documents/2023-04/CLiME_Final%20Report.pdf
- Fifth National Climate Assessment. 15. *Human Health, Systemic Racism and Discrimination Exacerbate Climate Impacts on Human Health*. 2023. Retrieved from https://nca2023.globalchange.gov/chapter/15/
- Hubbart, S. Exploring the Intersectionality of Environmental Justice and Pride Month. NEEF. June 2023. Retrieved from https://www.neefusa.org/story/environmental-education/exploring-intersectionality-between-environmental-justice-and-pride
- Global Change.gov. *Climate and Health Assessment. Populations of Concern*. September 2021. Retrieved from https://health2016.globalchange.gov/populations-concern
- LCV. *Why Climate Justice Must Include LGBTQ+ Justice*. June 2023. Retrieved from https://www.lcv.org/blog/why-climate-justice-must-include-lgbtq-justice/Pathak, N. *How Climate Change Harms Children's Health.* 2023. Retrieved from https://yaleclimateconnections.org/2023/06/how-climate-change-harms-childrens-health/#:~:text=From%20the%20earliest%20moments%20of,risk%20for%20mental%20health%20conditions.
- United Nations. *Climate Promise. Why does gender equality have to do with climate change?* 2023. Retrieved from https://climatepromise.undp.org/news-and-stories/what-does-gender-equality-have-do-climate-change
- United Nations. United National Human Rights, Office of the High Commissioner. *Analytical Study on the Promotion and Protection of the Rights of Persons with Disabilities in the Context of Climate Change*. 2020. Retrieved from https://www.ohchr.org/en/documents/thematic-reports/analytical-study-promotion-and-protection-rights-persons-disabilities
- Young, C. *Climate Pledges Need Indigenous Peoples*. 2022. Retrieved from https://www.undp.org/blog/climate-pledges-need-indigenous-peoples

GUIDELINES IN PRACTICE

Meet the Future: Transforming Vacant Land in Detroit

Empowering communities to reimagine the city

It has been a decade since Detroit's historic bankruptcy. Although the signs of recovery are palpable throughout Downtown, Midtown, Corktown, NewCenter, and the Riverfront—with clear signs of private investment and development—a different reality exists when you leave these more central parts of the city. An estimated 19 square miles of vacant land remain scattered throughout Detroit, representing unique opportunities and complex challenges. Who acquires this vacant land and how it is transformed holds the potential to empower communities to reinvent the future of Detroit, something that University of Michigan School for Environment and Sustainability (SEAS) Assistant Professor of Practice in Landscape Architecture Lisa DuRussel, alongside her students and community collaborators, is passionate about ensuring.

With her grassroots, ground-up approach, DuRussel believes strongly in forging relationships with local community members and leaders—building rapport by being present and putting power into the hands of the residents while leveraging university resources to support their visions. The trust she has built has allowed DuRussel to integrate her deep connections into the projects she designs for her students.

Helping Detroiters acquire and plan for vacant land

DuRussel facilitated one recent master's project, dubbed Greenprint Detroit, aimed at helping the residents of Detroit navigate the land acquisition process through the Detroit Land Bank Authority (DLBA). This public authority has owned and managed around 100,000 parcels of property in Detroit consisting of vacant lots and abandoned houses, in addition to other structures forced into tax foreclosure.

continued on the following page

However, the DLBA and the way it operates have faced some criticism, with one of the significant issues raised by Detroiters being the difficulty of effectively navigating the property-buying process through DLBA. For example, when purchasing land through DLBA, the buyer must submit a plan proposing how the land will be used and transformed within six months of acquisition. Creating such a plan can be a complex process, and while several organizations in Detroit offer premade plans, many of them are designs that are far too expensive for residents to follow through on.

This challenge inspired the Greenprint Detroit project team to work with community members to create a thoughtful, helpful, and realistic toolkit on how to attain and transform vacant land. The toolkit offers a blueprint of sorts, with plans that consider climate adaptation by "decolonizing lawns—or planting meadows or rain gardens that improve infiltration and aid in stormwater management so landscapes can better handle extreme weather events—and welcoming wildlife.

"A lot of the premade plans that were available to residents were amazing $100K landscapes, but that doesn't match the need of most Detroiters acquiring vacant land. Most residents have enough funding to create a community or urban garden, so what we realized is that we needed to be field catalysts and work more one-on-one with residents to hear their visions and then help them either draft their own plans or create one for them," says DuRussel.

The resulting toolkit offered pre-designed renovation options that came with cost estimates. "Someone could just rip a page out of the book and submit it to DLBA and say, here is my plan. So, the bulk of the work is done," says DuRussel. DuRussel adds that having a plan in hand also allows residents to more easily file for a permit with the city to zone the lot from vacant to other use, such as an urban garden or an orchard.

Empowering local communities in revitalizing vacant land

Tanya Stephens founded and runs Detroit Vacant Land CDC, a community development organization dedicated to preserving, beautifying, and activating vacant land in Detroit. Stephens, who launched the nonprofit in 2020, just months into the COVID-19 pandemic, was interested in finding ways to repurpose green space for safe social distancing. But, realizing the abundance of underutilized land, her ultimate vision was to support residents in reclaiming land in their communities by offering a range of resources for creative uses, such as community gardens, urban farms, and art parks.

Stephens approached DuRussel for help ensuring that the soil on her properties was safe for agriculture and supporting native species and habitats. "Lisa and her team of students were able to do soil tests on our sites and design a plot plan," says Stephens. "They did an amazing job, and I was relieved that no major contaminants were found so I could safely proceed with my plan to create a robust community garden and functional green spaces."

Stephens is collaborating with DuRussel on a new concept, Detroit Land Lab, which will provide a range of educational opportunities on eco-literacy, such as help with landscape design, plant identification, and soil testing, to empower residents not just to acquire land but to preserve, beautify and activate it.

Written by Nayiri Mullinix, Communications Specialist, School for Environment and Sustainability, University of Michigan.

This article was originally published in *Stewards Magazine*. Spring/Summer 2023. Read the full article at https://seas.umich.edu/stewards/spring-2023/meet-future-transforming-vacant-land-detroit

Resource #6

Climate Change Research and Policy Reports

Selected Climate Change Education Research

Research into what makes climate change effective is critical to improving our practices. Early in the process of developing this set of guidelines, we searched the literature to learn more about what research has to say about what makes climate education effective. The body of literature is growing exponentially with important findings becoming available every year. We found the following research publications helpful.

- Cantell, H., S. Tolppanen, E. Aarnio-Linnanvuori and A. Lehtonen. *Bicycle Model on Climate Change Education: Presenting and Evaluating a Model*. Environmental Education Research. 2019. 25(5), 717-731. https://doi.org/10.1080/13504622.2019.1570487
- Li, C. and M. Monroe. *Exploring the Essential Psychological Factors in Fostering Hope Concerning Climate Change*. Environmental Education Research. 2019. 25(6), 936–954 https://doi.org/10.1080/13504622.2017.1367916
- Monroe, M., R. Plate, A. Oxarart, A. Bowers, and W. Chaves. *Identifying Effective Climate Change Education Strategies: A Systematic Review of the Research*. Environmental Education Research. 2019. 25(6), 791-812. https://doi.org/10.1080/13504622.2017.1360842
- Ojala, M. Hope and Climate Change: The Importance of *Hope for Environmental Engagement Among Young People*. Environmental Education Research. 2012. 18(5), 625-642, https://doi.org/10.1080/13504622.2011.637157
- Reid, A. *Climate Change Education and Research: Possibilities and Potentials Versus Problems and Perils?* Environmental Education Research. 2019. 25(6), 767-790, https://doi.org/10.1080/1304622.2019.1664075

Selected Policy-Related Reports and Research

These Guidelines are intended for educators interested in using education to address climate change. Although it is not written as a guide to developing educational policy related to climate change, some of the available research and policy reports may also be of interest.

- Bowman, T., and D. Morrison. *An ACE National Strategic Planning Framework for the United States* [Online]. Created in collaborative reflection with the U.S. ACE Community. 2020. Retrieved from https://www.usacecoalition.org/publications
- EDGE Research & NAAEE. *The State of Climate Change Education: Findings from a National Survey of Educators*. October 2022. Retrieved from https://naaee.org/sites/default/files/2023-02/NAAEE_State%20of%20Climate%20Change%20Education%20Report_SUBMITTED%2012_12_22%5B1%5D.pdf
- Hargis, K. and M. McKenzie. *Responding to Climate Change: A Primer for K-12 Education*. The Sustainability and Education Policy Network, Saskatoon, Canada. 2020. Retrieved from https://sepn.ca/resources/report-responding-to-climate-change-education-a-primer-for-k-12-education/

- Katz, E., L. Schifter, and A. La Pinta. *A State Policy Landscape: K12 Climate Action*, The Aspen Institute: Washington, DC. 2020. Retrieved from https://www.aspeninstitute.org/publications/landscape-report-2020/
- Kwauk C. and O. Casey. *A New Green Learning Agenda: Approaches to Quality Education for Climate Action*. Washington, DC: Brookings. 2021. Retrieved from https://www.brookings.edu/wp-content/uploads/2021/01/Brookings-Green-Learning-FINAL.pdf
- MEECE Project (Monitoring and Evaluating Climate Communication and Education Project). 2023. Retrieved from https://mecce.ca/
- MECCE & NAAEE. *Mapping the Landscape of Higher Education Climate Change Education Policy in the United States*. Monitoring and Evaluating Climate Communication and Education Project and North American Association of Environmental Education. May 2023. Retrieved from https://dg56ycbvljkqr.cloudfront.net/sites/default/files/eepro-post-files/Mapping-Landscape-Climate-Change-Higher-Ed-Report_Acc_0.pdf
- MECCE & NAAEE. *Mapping the Landscape of K–12 Climate Change Education Policy in the United States*. Monitoring and Evaluating Climate Communication and Education Project. May 2022. Retrieved from https://eepro.naaee.org/sites/default/files/eepro-post-files/mapping_the_landscape.full_report_0.pdf
- NCSE and Texas Freedom Network Education Fund. *Making the Grade? How State Public School Science Standards Address Climate Change*. 2020. Retrieved from https://climategrades.org/
- Rodler, L. and R. Renbarger. *Strengthening Climate Change Education in the United States*. Durham, NC: FHI 360. 2023. Retrieved from https://www.fhi360.org/sites/default/files/media/documents/resource-strengthening-climate-change-us-education.pdf
- Sabarwal, S., M. Venegas, M. Sergio Spivack, and D. Ambasz. 2024. Choosing Our Future: Education for Climate Action. Washington, DC: World Bank. Retrieved from: https://openknowledge.worldbank.org/server/api/core/bitstreams/9d1c318a-bcd3-49fa-b1c6-cc03e18d4670/content
- Sustainability and Education Policy Network (SEPN). R*esponding to Climate Change: A Primer for K-12 Education*. 2021. Retrieved from https://sepn.ca/wp-content/uploads/2021/01/SEPN-CCEd-Primer-January-11-2021.pdf

Updates and additional information on the Coalition for Climate Education Policy is available at https://naaee.org/programs/coalition

More Case Studies Supporting Climate Action and Justice

Throughout this set of guidelines, we have developed various case studies (Guidelines in Practice) that help illustrate educating for climate action and justice. There are many more collections of easily accessible case studies you may find interesting:

- ClimeTime. Partner Stories, https://www.climetime.org/partner-stories/
- ClimeTime. Project Portraits, https://www.climetime.org/project-portraits/
- Global Environmental Education Partnership (GEEP). Case Studies, https://thegeep.org/learn/case-studies
- Monitoring and Evaluating Climate Communication and Education Project (MECCE). Case Studies, https://mecce.ca/data-platform/case-studies/
- NAAEE. Climate Education and Policy Case Studies, https://naaee.org/programs/coalition/resources/climate-education-policy-case-studies
- NZCER. Climate Change (Educational Policy and Practice for a Changing Climate), https://www.nzcer.org.nz/research/climate-change

Resource #7

Elements of Effective Climate Change Education

Climate change education's (CCE) ultimate goal is to inspire people, individually and collectively, to take action to address climate change. As educators, we can help learners reach this goal through specific learning approaches, as described in Figure 1.

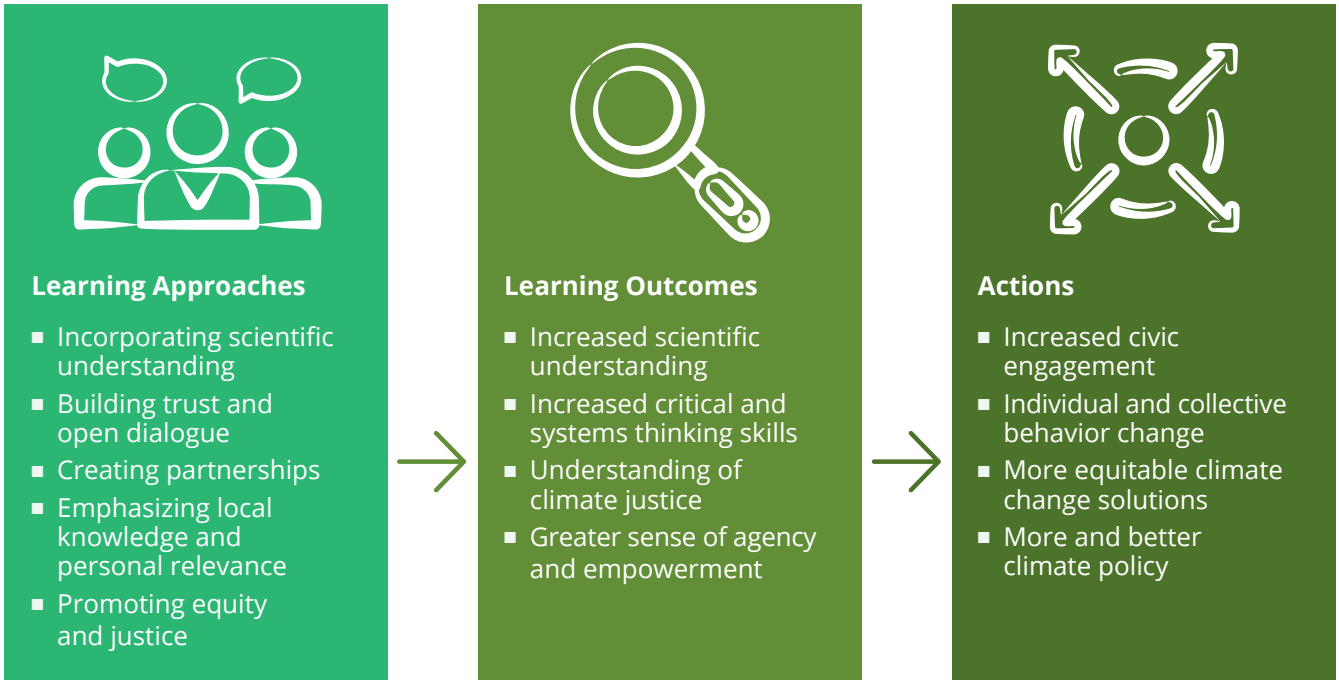


Figure 1. Key components of effective climate change education

Building trust and open dialogue

A quick web search will uncover answers to almost any question we might ask about climate change. But how can we be sure the answers we find are fact-based? The complexities of climate change, coupled with the ways in which the issue is politicized, leave it wide open to misrepresentation. Even the most experienced can find it challenging to sort fact from fiction. The most effective climate change education programs take this reality into account. If we implement approaches built on a foundation of trust, and if we promote open and free discussions and encourage learners to seek common ground, we can help them grapple more effectively with the complexities of climate change. By relying on these elements—trust and open and free exchange of ideas—we also empower ourselves, even as we may struggle with our own conflicting beliefs and group identities.[1] Our cultural norms, family background, and political leanings can shape our beliefs about climate change—and how we teach about climate change. We must recognize our personal beliefs to support learners effectively as they explore their own.

Creating mutually beneficial partnerships

We can lower the volume of misinformation by bringing more voices into the conversation, especially more trusted voices. For example, scientists and educators can develop more scientifically accurate and pedagogically sound CCE programs when they work together. This kind of collaboration allows both educators and scientists to learn from and with each other and can elevate educators' confidence in teaching about climate change.[2]

Emphasizing local knowledge and personal relevance

Local knowledge—the collective knowledge and insights a community acquires over time—is also important to consider as we address climate change. The most promising and impactful CCE programs are rooted in local knowledge and work to incorporate the unique ways in which a community understands its experiences, leveraging that understanding to create relevant learning opportunities and actions.[3]

Promoting equity and justice

Climate change disproportionately impacts some populations, leaving many communities at far greater risk. This unequal impact will persist unless the world, as a whole, works to understand and address it. Low-income communities and several specific populations—people of color, Indigenous peoples, people with disabilities, young people, and women—are statistically at a greater risk of experiencing impacts of climate change, such as food and water insecurity, or the dangers of poor air quality and foods.[4] Climate justice recognizes these inequalities and seeks to shift conversations from a narrow focus on environmental issues to a broad view that examines the impact of environmental events in parallel with the socioeconomic consequences of our warming world. By understanding how specific populations are unequally and unfairly affected by climate change, we can also work to ensure that their voices influence decisions about climate policy and actions. Exploring the impact of climate change on Indigenous peoples can help us better understand climate justice. These populations have suffered from the consequences of climate change and face personal displacement and the exploitation, or even loss, of natural resources. Indigenous peoples attribute deep cultural values to natural places, and these values inform their local knowledge,[5] but this knowledge may be exploited or even dismissed in the design of climate change solutions.[6] CCE's focus on building trust and promoting open dialogue can bring inequities—inadvertent or intentional—into focus.

Building agency and empowerment

As discussed in earlier sections, strong climate change education works to develop trust, address misconceptions, build collaborations, and leverage local knowledge. This holds true whether the CCE takes place in school or elsewhere.

Written by Melissa Taggart, Managing Director, NAAEE. Excerpted, with permission, from *Climate Change*, Environmental Education in Action: Learning from Case Studies Around the World Climate Change. GEEP, Retrieved from https://thegeep.org/learn/case-studies/ebook

GEEP is a partnership of the International Environmental Partnership, the Taiwan Ministry of Environment, the United States Environmental Protection Agency, and the North American Association for Environmental Education. To learn more about GEEP, visit thegeep.org.

[1] Monroe, M., R. Plate, A. Oxarart, A. Bowers, and W. Chaves. *Identifying Effective Climate Change Education Strategies: A Systematic Review of the Research.* Environmental Education Research, 25:6, (2017): 791-812. https://doi.org/10.1080/13504622.2017.1360842.

[2] Ibid.

[3] Ibid.

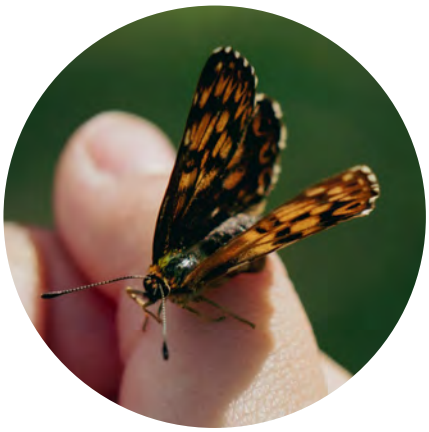
[4] Simmons. D. *What is "Climate Justice"?* Yale Climate Connections. New Haven: Yale School of the Environment, 2020. Retrieved from https://yaleclimateconnections.org/2020/07/what-is-climate-justice/.

[5] Nyong, A., F. Adesina, and B. Osman-Elasha. *The Value of Indigenous Knowledge in Climate Change Mitigation and Adaptation Strategies in the African Sahel*. Mitigation and Adaptation Strategies for Global Change 12 (2007):787–797. Retrieved from https://doi.org/10.1007/s11027-007-9099-0.

[6] Rosa-Aquino, P. *To Share or Not to Share?* www.grist.org. November 21, 2018. Retrieved from https://grist.org/article/indigenous-knowledge-climate-change-solution/.

Resource #8





Teaching Young Children: Developmentally Appropriate Practice

It's not too surprising: Young children (birth to age 8) have different learning needs than older children, youth, and adults. Young children are active and inquisitive. They explore everything with all their senses. Their minds and bodies are growing at a phenomenal pace, developing neural connections they will use for the rest of their lives. Learning is everything; experience is everything. Young children are making discoveries and creating connections. They are beginning to understand their individuality and the individuality of others. And they are starting to build relationships between themselves and others and between themselves and the world around them. Providing opportunities for the growth and development of the whole child, opportunities to develop a sense of wonder about nature, and earnest engagement in discovering the real world are the foundation for learning in early childhood.

Educational activities for young children must be based on Developmentally Appropriate Practice (DAP). According to NAEYC:

> Developmentally appropriate practice (DAP) is an approach to teaching grounded in the research on how young children develop and learn and in what is known about effective early education. Its framework is designed to promote young children's optimal learning and development. DAP involves teachers meeting young children where they are, both as individuals and as part of a group, and helping each child meet challenging and achievable learning goals.
>
> *As they make decisions, teachers consider these three areas of knowledge:*
>
> - ***Knowing about child development and learning***
>   *Understanding typical development and learning at different ages is a crucial starting point. This knowledge, based on research, helps us predict which experiences will support children's learning and development.*
> - ***Knowing what is individually appropriate***
>   *What we learn about specific children helps us refine decisions about how to teach and care for each child as an individual. By continually observing children's play and interaction with the physical environment and others, we learn about each child's interests, abilities, and developmental progress.*
> - ***Knowing what is culturally important***
>   *We must make an effort to get to know the children's families and learn about the values, expectations, and factors that shape their lives at home and in their communities. This background information helps us provide meaningful, relevant, and respectful learning experiences for each child and family.*
>
> *Taken together, all three considerations result in developmentally appropriate practice.*

Source: NAEYC. Core Considerations of DAP. National Association for the Education of Young Children. 2009. Retrieved from https://www.naeyc.org/resources/position-statements/dap/core-considerations

If you want to learn more about developmentally appropriate practice and early childhood environmental education, here are some resources worth exploring.

- Ardoin, N. and A. Bowers. *Early Childhood Environmental Education: A Systematic Review of the Research Literature*. Educational Research Review 31. November 2020. Retrieved from https://doi.org/10.1016/j.edurev.2020.100353.
- Merrick, C. *Early Childhood Environmental Education*. n.d. Retrieved from https://thegeep.org/sites/default/files/files/GEEP.EarlyChildhoodEEChapter.pdf
- NAEYC. 10 *Effective DAP Teaching Strategies*. n.d. Retrieved from https://www.naeyc.org/resources/topics/dap/10-effective-dap-teaching-strategies
- Natural Start Alliance, https://naturalstart.org/
- NAAEE. *International Journal of Early Childhood Environmental Education*. Retrieved from https://naturalstart.org/research
- Simmons, B. et al. *Early Childhood Environmental Education Programs: Guidelines for Excellence*. Washington, DC: NAAEE. 2016. Retrieved from https://eepro.naaee.org/sites/default/files/eepro-post-files/early_childhood_ee_guidelines.pdf
- Oltman, M. *Natural Wonders: A Guide to Early Childhood for Environmental Educators*. Minnesota Early Childhood Environmental Education Consortium. 2002. Retrieved from https://www.pca.state.mn.us/sites/default/files/p-ee5-04.pdf
- Rooney, T. and M. Blaise. *Rethinking Environmental Education in a Climate Change Era: Weather Learning in Early Childhood*. NY, NY: Routledge. 2023. Retrieved from https://www.routledge.com/Rethinking-Environmental-Education-in-a-Climate-Change-Era-Weather-Learning-in-Early-Childhood/Rooney-Blaise/p/book/9780367713461

Resource #9

Features of Positive Youth Development

Positive Youth Development (PYD) combines positive experiences, positive relationships, and positive environments. The Interagency Working Group on Youth Programs (IWGYP) defines PYD as follows:

> *[PYD is] an intentional, prosocial approach that engages youth within their communities, schools, organizations, peer groups, and families in a manner that is productive and constructive; recognizes, utilizes, and enhances young people's strengths; and promotes positive outcomes for young people by providing opportunities, fostering positive relationships, and furnishing the support needed to build on their leadership strengths.*

Source: Interagency Working Group on Youth Programs (IWGYP). Positive Youth Development. n.d. Retrieved from https://youth.gov/youth-topics/positive-youth-development.

Features of Positive Youth Development

Promoting PYD requires attention and planning. The National Research Council (2002) has developed a provisional list of characteristics of settings that support PYD:

- ***Physical and Psychological Safety***
  Safe and health-promoting facilities and practices that increase safe peer group interaction and decrease unsafe or confrontational peer interactions
- ***Appropriate Structure***
  Limit setting, clear and consistent rules and expectations, firm-enough control, continuity and predictability, clear boundaries, and age-appropriate monitoring
- ***Supportive Relationships***
  Warmth, closeness, connectedness, good communication, caring, support, guidance, secure attachment, and responsiveness
- ***Opportunities to Belong***
  Opportunities for meaningful inclusion, regardless of one's gender, ethnicity, sexual orientation, or disabilities; social inclusion, social engagement, and integration; opportunities for sociocultural identity
- ***Positive Social Norms***
  Rules of behavior, expectations, injunctions, ways of doing things, values and morals, and obligations for service
- ***Support for Efficacy and Mattering***
  Youth-based empowerment practices that support autonomy, making a real difference in one's community, and being taken seriously. Practices that include enabling, responsibility granting, and meaningful challenge. Practices that focus on improvement rather than on relative current performance levels.

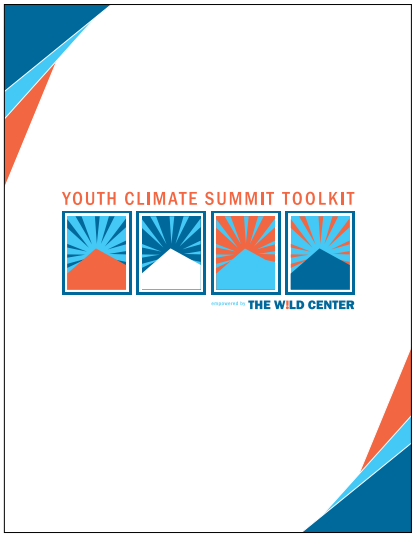
- ***Opportunities for Skill Building***
  Opportunities to learn physical, intellectual, psychological, emotional, and social skills; exposure to intentional learning experiences; opportunities to learn cultural literacies, media literacy, communication skills, and good habits of mind; preparation for adult employment; and opportunities to develop social and cultural capital
- ***Integration of Family, School, and Community Efforts***
  Concordance, coordination, and synergy among family, school, and community

Source: National Research Council. *Chapter 4: Features of Positive Youth Development, in Community Programs to Promote Youth Development.* Washington, DC: The National Academies Press. 2002. Retrieved from https://nap.nationalacademies.org/read/10022/chapter/6

Additional resources you might find interesting:

- US Department of Health & Human Services. Family and Youth Services Bureau. *Positive Youth Development*. 2017. Retrieved from https://www.acf.hhs.gov/fysb/positive-youth-development
- YouthPower2. *Promoting Positive Youth Development*. n.d. Retrieved from https://www.youthpower.org/positive-youth-development
- You for Youth. *Positive Learning Environment Observation Checklist*. 2019. Retrieved from https://y4yarchives.org/tools/positive-learning-environment-observation-checklist

Youth Climate Summit Toolkit



Working with youth on climate action strategy development is a high priority for many. Thankfully, the WILD Center has created the *Youth Climate Summit Toolkit*, an easy-to-use resource that provides step-by-step suggestions on planning and hosting summits that ignite youth-driven climate action. The Toolkit, along with supplemental resources, offers suggestions for determining the what, where, when, and how of summit planning—everything from tips for facilitating planning meetings with students to recommendations for creating an agenda and developing a budget to making the event sustainable.

As might be expected, building climate action planning into the Summit is a high priority. Using the Climate Action Planning (CAP) Facilitator Guide, supplemented with a slide deck, facilitator script, and CAP templates, time is set aside during the Summit so that every participant can leave with a concrete action plan. Examples of Climate Action Projects include:

- Local students in Lake Placid started their own community composting business, Placid Earth Composting, to reduce local food waste.
- Saranac Lake High School students worked with their local government to earn their NYS Climate Smart Communities bronze certificate.
- Saranac Lake High School students planned a carbon-neutral prom to offset emissions and educate their school about the climate cost of a prom.

To read more about planning a Youth Climate Action Summit and to download the free guide, visit https://www.wildcenter.org/our-work/youth-climate-program/youth-climate-summit-toolkit/

GUIDELINES IN PRACTICE

Teaching Climate with Science, History, and Storytelling

Many locations across the globe have a political culture that makes it challenging to teach about a changing climate. For example, in Oklahoma, here is no requirement to teach about mitigating or adapting to the changing climate in state academic standards. As a result, relatively few educational resources are available, and it is difficult for teachers to justify teaching these topics. Educators need help finding resources and developing a community of practice.

Oklahoma has a long history of experiencing and adapting to the devastating effects of a changing climate. Environmental educators in Oklahoma are combining a storytelling approach that uses their state's Dust Bowl history to tell a story of resilience and hope that empowers students and teachers to seek effective actions in the face of a changing climate. Oklahoma's Dust Bowl history includes direct action taken in the 1930s and 40s, such as planting shelterbelts and changing agricultural practices, to mitigate the damage to local ecosystems and stabilize society. By connecting history to today, educators can connect catastrophe to innovation and perseverance.

In August 2023, Oklahoma Mesonet—a leader in Oklahoma's Weather Network—hosted an educator workshop at the National Weather Center in Norman, Oklahoma, in partnership with Project Learning Tree, Project WET, and the South Central Climate Adaptation Science Center. Participants ranged from Pre-K to high school teachers and nonformal educators. Attendees learned about the issues from National Weather Center scientists, including details on how the changing climate is and will continue to affect Oklahoma's ecosystems and populations. Each partner organization shared resources for teaching about these issues, and participants were able to plan how they could use or adapt the resources for their unique setting.

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GUIDELINES IN PRACTICE

Teaching Climate with Science, History, and Storytelling

With a successful professional development model, collaborative partners in environmental education, and demand from educators in the field, it was decided to offer this workshop twice annually. By providing educators with high-quality, standards-aligned curriculum content and making hands-on inquiries easy to facilitate and implement, more educators can teach about our changing climate, and more kids can learn about related issues.

Why It Works:

- This innovative approach of telling the story of Oklahoma's Dust Bowl and corresponding professional development opportunity present a localized approach to teaching about climate change and connecting it to a single state's specific history.
- This approach to teaching climate science in Oklahoma showcases how multiple organizations can collaborate using various resources to support many grade levels and subject areas.

The organizers believe that thousands of students can be reached by giving educators the tools to teach this topic in a localized way. As more educators become involved, this growing and empowered community of practice can support one another and continue to share resources and ideas.

For more information:

• Oklahoma Forestry Services - Outreach and Education: https://ag.ok.gov/outreach-and-education/
• Project Learning Tree: https://www.plt.org/
• Project WET: https://www.projectwet.org/
• Oklahoma Mesonet: https://mesonet.org/
• National Weather Center, the University of Oklahoma: https://www.ou.edu/nwc
• South Central Climate Adaptation Science Center: https://southcentralclimate.org/

Resource #10

Reliable Sources

Background information and facts, including information that provides context for the concepts being developed (e.g., information about social, cultural, political, historical, economic, and ecological systems and their interrelationships), may well be presented in instructional materials. But how do you know if that information and source of information is reliable? The following criteria, from Stevenson University, may be valuable as you work to decide whether or not to trust the information source:

- ***Authority****: Who is the author? What are their credentials? Do they have knowledgeable experience in the field they are writing about?*
- ***Accuracy****: Compare the author's information to that which you already know is reliable. Are there proper citations? Is the information biased? If so, does it affect research conclusions?*
- ***Coverage****: Is the information relevant to your topic and does it meet your needs? Consider what you need such as statistics, charts, and graphs.*
- ***Currency****: Is your topic constantly evolving? Topics in technology and medical innovation require sources that are up-to-date.*

Source: Stevenson University Online. *How to Identify Reliable Information.* 2023.
Retrieved from https://www.stevenson.edu/online/about-us/news/how-to-identify-reliable-information/

If you want to learn more about reliable sources, here are some resources worth exploring.

- Kiely, E. and L. Robertson. *How to Spot Fake News*. FactCheck.Org. 2016. Retrieved from https://www.factcheck.org/2016/11/how-to-spot-fake-news/
- University Libraries, University of Georgia. *Criteria for Evaluating Reliability*. 2023. Retrieved from https://guides.libs.uga.edu/c.php?g=571070&p=3937349

Five Questions to Ask about Media

All information comes from somewhere—whether discussed on a TV show, posted on social media, or published in a newspaper. Someone, or in the case of artificial intelligence (AI), something authored it. Someone published or distributed it. Someone made decisions about what information was to be conveyed and how it should be conveyed. Determining the appropriateness of an information source is not necessarily easy though. The following questions, based on the work of the National Association of Media Literacy Education, may help.

Five Questions to Ask About Media

1. ***Who created this message?***
   a. *Was it created by an individual, a group, an organization, or a company?*
2. ***Why was the message made?***
   a. *Is the message's purpose to inform? To entertain? To persuade? (Or some combination?)*
   b. *Who is the message's intended audience?*
3. ***Who paid (or is paying) for this message?***
   a. *Money motivates a lot of media—who paid to have this message made?*
   b. *What else have they paid for? What other agendas might they have?*
4. ***How is the message trying to get your attention?***
   a. *What techniques are being used to grab people's attention?*
   b. *What techniques are being used to keep people's attention?*
5. ***Who is represented in the message? And who is missing?***
   a. *Whose points of view and values are represented (or being appealed to)?*
   b. *Whose points of view and values are missing?*

Adapted from Mendoza, K. *Five Questions Students Should Ask About Media*. Common Sense Education. 2023. Retrieved from https://www.commonsense.org/education/articles/5-questions-students-should-ask-about-media

Artificial Intelligence and Media Literacy

From ChatGPT to Siri to deep fakes, artificial intelligence (AI) impacts how information is accessed and processed. AI is everywhere. According to Jean Philip De Tender[1], AI presents a double-edged sword. It can facilitate media literacy by improving our ability to efficiently analyze information, detect deepfakes, and identify content sources. AI also presents challenges—by creating deepfakes and algorithms that manipulate what posts or news stories are promoted and who receives them. Bill Shribman[2] echoes this analysis suggesting that "A tools and weapons[3] approach is a useful rubric for thinking about what guidance about the power and opportunity afforded by AI — broadly, what media literacy — we all need." He concludes that "the underlying tenets of media literacy still hold true."

For educators, the critical question remains: "How can educators help students think critically and evaluate all types of communication including digital platforms?" Education Now convened a panel to address this question. Panelists offered three summary suggestions.

1. *It is never too soon and never too late to empower students to think critically and creatively, not cynically, about generative AI and all media. An inquiry mindset is a good entry point.*
2. *Teach students the habit of asking inquiry-based critical thinking questions and remind them that all media are created and what is included and excluded influences the messages that are conveyed.*
3. *Don't give AI too much power. Everyone, including educators, should actively question the role they want new technologies to have in our lives, including our schools, colleges, and universities.*

Source: Education Now. *Media Literacy Education and AI.* 2024. Retrieved from https://www.gse.harvard.edu/ideas/education-now/24/04/media-literacy-education-and-ai

If you want to learn more about media literacy, here are some resources worth exploring.

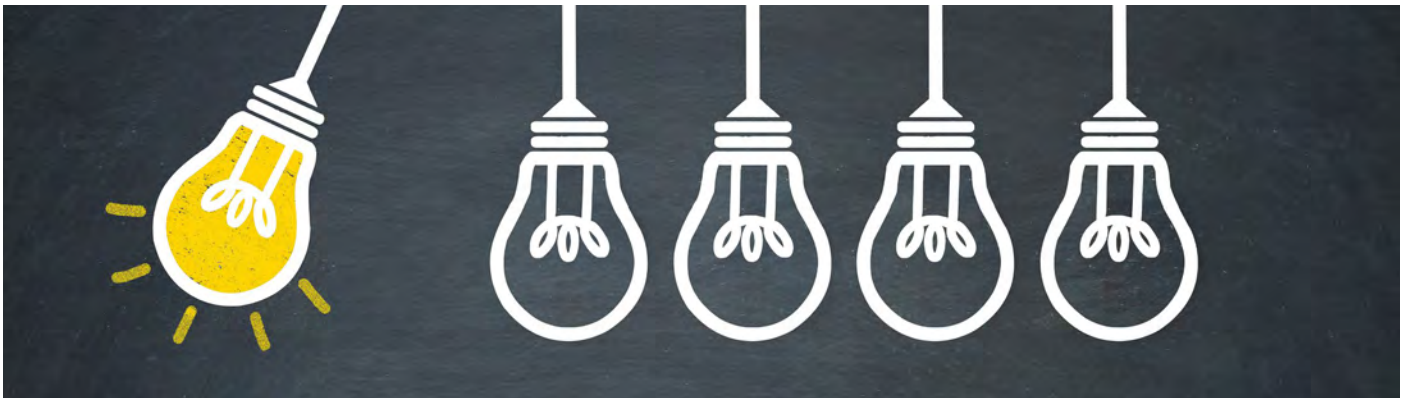
- Facing History & Ourselves. *Learning to Navigate Generative AI Content: Media Literacy Strategies*. 2023. Retrieved from https://www.facinghistory.org/resource-library/learning-navigate-generative-ai-content-media-literacy-strategies?utm_term=&utm_campaign=DSA&utm_source=adwords&utm_medium=ppc&hsa_tgt=dsa-19959388920&hsa_grp=75449327748&hsa_src=g&hsa_net=adwords&hsa_mt=&hsa_ver=3&hsa_ad=333182733490&hsa_acc=4949854077&hsa_kw=&hsa_cam=1635938820&gad_source=1&gclid=Cj0KCQjwztOwBhD7ARIsAPDKnkCntoKlLnZh9ZtC5thBIVBljaBANaOAUvaTSXO33F81u6-CsFnzzZYaApK0EALw_wcB
- International Federation of Library Associations and Institutions (IFLA). *How to Spot Fake News*. 2017. Retrieved from https://www.ifla.org/news/how-to-spot-fake-news-ifla-in-the-post-truth-society/
- National Association of Media Literacy Education. *Key Questions to Ask When Analyzing Media Experiences*. 2023. Retrieved from https://namle.net/resources/key-questions-for-analyzing-media/
- News Literacy Project. *News Literacy Tips, Tools, and Quizzes*. 2023. Retrieved from https://newslit.org/tips-tools/
- Wallace, K. *Levels of Scientific Evidence, with Dr. Kat*. 2023. News Literacy Project Retrieved from https://newslit.org/wp-content/uploads/2022/12/Levels-of-Evidence_infographic_FINAL.pdf

[1] De Tender, J. Navigating the Digital Frontier: *The Impact of AI on Media Literacy.* EBU. 2023. Retrieved from https://www.ebu.ch/news/2023/10/navigating-the-digital-frontier--the-impact-of-ai-on-media-literacy

[2] Shribman, B. You Know, For Kids: The State of Media Literacy for Young People in the Age of Generative AI. 2023. Retrieved from https://medium.com/berkman-klein-center/you-know-for-kids-47731a0a72f8\

[3] A tools and weapons approach means that any technology (such as AI) has positive benefits (tools) and negative consequences (weapons).

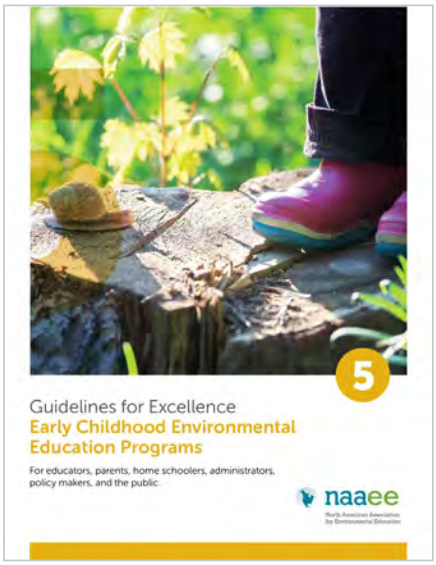
Resource #11



Learning Frameworks

Learning frameworks are useful tools for homing in on applicable instructional objectives. To help educators in this work, NAAEE has developed a series of publications that should prove helpful in developing climate education programs. Starting with early childhood (birth through age 8) and continuing through graduation from high school (age 18), these publications describe the competencies needed to make well-informed choices and exercise the rights and responsibilities of community members.

Early Childhood Environmental Education Programs: Guidelines for Excellence



These Guidelines for Excellence offer a set of recommendations for developing comprehensive early childhood environmental education programs. They are designed to assist educators, administrators, or program developers concerned about the quality of early childhood environmental education programs. In addition to offering guidance on topics such as developmentally appropriate practices and play and exploration, they outline a learning framework educators can use in program development.

Framework for Environmental Learning

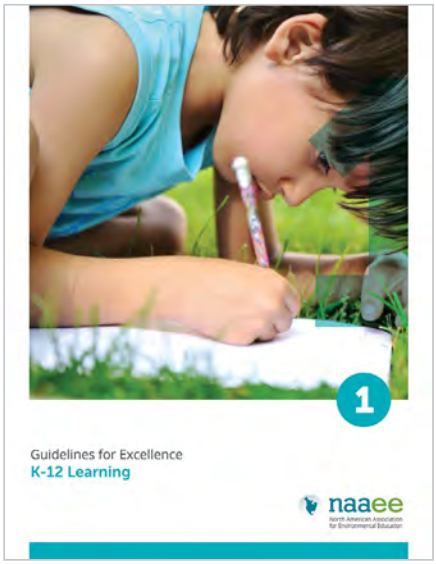
Young children are provided opportunities to explore their environment and develop knowledge and skills. Educators intentionally foster growth and development across social-emotional, cognitive, physical, and language domains. As the child matures into adulthood, this learning will lead to environmental literacy.

The framework focuses on providing opportunities for the development of:

- **Social and Emotional Growth**
- **Curiosity and Questioning**
- **Environmental Understandings**
- **Skills for Understanding the Environment**
- **A Personal Sense of Responsibility and Caring**
- **Physical Health and Development**

Simmons, B., et al. *Early Childhood Environmental Education Programs: Guidelines for Excellence.* North American Association for Environmental Education. 2009. Retrieved from: https://eepro.naaee.org/sites/default/files/eepro-post-files/early_childhood_ee_guidelines.pdf

K–12 Environmental Education: Guidelines for Excellence



K–12 Environmental Education: Guidelines for Excellence offers a vision of environmental education that promotes progress toward sustaining a healthy environment and quality of life. Four organizing strands represent broad aspects of environmental literacy. These strands are further defined by guidelines that articulate knowledge and skill benchmarks in key areas for the end of each of three grade levels—fourth (age 10), eighth (age 14), and twelfth (age 18).

- **Strand 1: Questioning, Analysis, and Interpretation Skills**
  Environmental literacy depends on learners' ability to ask questions, speculate and hypothesize about their surroundings, seek information, and develop answers to their questions. Learners must be familiar with inquiry, master fundamental skills for gathering and organizing information, and interpret and synthesize information to develop and communicate explanations.

  A. Questioning
  B. Designing investigations
  C. Collecting information
  D. Evaluating accuracy and reliability
  E. Organizing and analyzing information
  F. Working with models and simulations
  G. Drawing conclusions and developing explanations

- **Strand 2: Environmental Processes and Systems**
  Environmental literacy depends on understanding the processes and systems that comprise the environment, including human social systems and influences. Students develop an understanding of how changes in one system (hydrosphere, atmosphere, geosphere, and biosphere) result in changes in another. They develop an understanding of how human activities affect environmental quality and long-term sustainability at local, tribal, national, and global levels. These understandings are based on knowledge synthesized from across traditional disciplines. The guidelines in this section are grouped into three sub-categories:

  2.1—Earth's physical and living systems
  A. Earth's physical systems
  B. Earth's living systems

  2.2—Human systems
  A. Individuals, groups, and societies
  B. Culture
  C. Political systems
  D. Economic systems

  2.3—Environment and society
  A. Human-environment interactions
  B. Resource distribution and consumption
  C. Places
  D. Change and conflict

- **Strand 3: Skills for Understanding and Addressing Environmental Issues**
  Skills and knowledge are refined and applied in the context of environmental issues at varying scales. Environmental literacy includes defining, learning about, evaluating, and acting on environmental issues. Students investigate environmental issues; consider evidence and differing viewpoints; and evaluate proposed action plans, including likely effectiveness in specific environmental, cultural, social, and economic contexts. They analyze the intended and unintended consequences of their actions and the actions taken by other individuals and groups, including long-term environmental, social, and economic implications for sustainability. In this section, the guidelines are grouped into two sub-categories:

  3.1—Skills for analyzing and investigating environmental issues
  - A. Identifying and investigating issues
  - B. Sorting out the consequences of issues
  - C. Identifying and critiquing alternative solutions and courses of action
  - D. Working with flexibility, creativity, and openness

  3.2—Decision-making and action skills
  - A. Forming and evaluating personal views
  - B. Evaluating the need for action
  - C. Planning and taking action
  - D. Evaluating the results of actions

- **Strand 4: Personal and Civic Responsibility**
  Environmentally literate community members are willing and able to act on their conclusions about what could be done to ensure environmental quality, social equity, and economic prosperity. As learners develop and apply concept-based learning and inquiry, analysis, and action skills, they also understand that what they do individually and in groups can make a difference.

  - A. Recognizing rights and responsibilities
  - B. Recognizing efficacy and developing agency
  - C. Accepting personal responsibility

Simmons, B., et al. *K–12 Environmental Education: Guidelines for Excellence*. North American Association for Environmental Education. 2019. Retrieved from: https://eepro.naaee.org/sites/default/files/eepro-post-files/k-12_ee_guidelines_for_excellence_2019_2.pdf

Civic Engagement for Environmental Issues (CEEI)

This learning framework, produced through a partnership between NAAEE and the Kettering Foundation, focuses on Civic Engagement for Environmental Issues (CEEI). The learning framework outlines a critical set of participant outcomes, including learner performance objectives, that can be used to develop comprehensive and cohesive education programs focused on facilitating civic engagement for environmental issues. The framework is organized around four learning domains:

- **CEEI Knowledge**
  Individuals develop an understanding of the processes and systems that impact environmental decision-making, including human social, cultural, political, and economic systems. Individuals understand how changes in one system result in changes in another. They understand the reciprocal interrelationship between humans and the environment, including how human activities affect environmental quality and long-term sustainability at various interconnected levels (e.g., local, tribal, national, and global). They use their knowledge to understand power relationships and policy options.
- **CEEI Skills**
  Individuals define, learn about, evaluate, and act on environmental and other community issues that impact well-being. Individuals investigate these issues; consider evidence from differing ways of knowing, viewpoints, and value positions; and evaluate proposed action plans, including policy options. They analyze the intended and unintended consequences of their actions, actions taken by other individuals and groups, and actions that impact policy on long-term environmental, social, and economic sustainability.
- **CEEI Dispositions**
  Individuals develop a sense of personal and civic responsibility. They are willing and able to act on their conclusions about what could be done to ensure environmental quality, social equity, and economic prosperity. They demonstrate self-efficacy and agency, understanding that what they do individually and in groups can make a difference.
- **CEEI Participatory Action**
  Individuals gain direct experiences in participatory action-taking. They work individually and collectively, applying the knowledge, skills, and dispositions necessary for taking action that addresses environmental and community issues, including policy issues.

Simmons, B. and M. Monroe. *The Promise of Civic Engagement for Environmental Issues: Synergy of Environmental Education and Civic Education*. North American Association for Environmental Education. 2020. Retrieved from: https://dg56ycbvljkqr.cloudfront.net/sites/default/files/eepro-post-files/promise_of_ee_and_civic_education__0.pdf

Resource #12

Using Science Investigations to Develop Caring Practices for Social-Ecological Systems

What is the issue?

How can we be more present for other species at a time of ecological devastation? Developing deep commitments to the human and more-than-human inhabitants of ecosystems is crucial for cultivating students' caring knowledge and practices within the escalating challenges of the climate crisis. More-than humans are typically represented in STEM curricula as objects of observation or utility rather than dynamic beings with rights to act and be recognized. All learners should build interdependent, caring relationships with more-than-humans focused on shared thriving to promote ecological identities, deep STEM learning about local places, and responsibilities.

Things to consider

- **Scientific and popular texts often talk about nature and culture as distinct, separate things** (e.g., images of nature with people looking down on pristine natural settings). In contrast, scientific studies have repeatedly shown that human and natural actors are tangled up with each other and are often in interaction or in nature-culture relations.
- **Children must have sustained, positive experiences with nature starting from the earliest years**. This builds their understanding of themselves as connected, embedded beings who are part of nature rather than apart from it. Meaningful early experiences with the natural world are a key catalyst for the development of ecological commitments, ethics, identities, and practices.
- **Young learners are naturally inclined toward curiosity, perspective-taking, and empathy for more-than-humans**. This supports them in building multi-species relationships through scientific inquiry, story work, role play, dramatization, sensorimotor play, music, visual arts, dance, gestural modeling, caregiving, and taking action to protect, recuperate, or sustain a local ecosystem.

Recommended actions you can take

- **Create rich opportunities for scientific inquiry for all students through outdoor investigations**. Building multi-species relationships enables learners to identify more-than-human qualities, actions, and interactions that can serve as anchor phenomena for investigations.
- **Promote multispecies relationships through practices of observation, attentiveness, receptivity, inquiry, and generating caring responses to relational partners**. For example, while exploring the effects of pollution on an ecosystem, students can learn about ecosystem dynamics, explore multiple species' perspectives, brainstorm responses, and take action. Students can learn how to engage in science practices in caring, ethical, and responsive.
- **Encourage learners to attend to the interconnectedness and mutual dependency of earth systems and human activities**. Support learners in understanding how their actions are embedded in webs of consequentiality, including how human actions significantly impact global systems and processes and how humans depend on care and sustenance from more-than-humans.
- **Design sustained, transdisciplinary inquiry-based learning opportunities around ecological caring relationships that are significant for learners and their communities**. Build partnerships with local organizations and community members to incorporate the ways of knowing and multi-species relationships valued in learners' families and communities.

Attending to equity

- Center multispecies justice—along with social justice—in science investigations. Ecosystem models often privilege human perspectives and interests. Disrupt human exceptionalism by attending to the concerns of a range of different species.
- Attend to learners' diverse sensemaking and relationship-building practices in more-than-human worlds and support navigation of different ways of knowing.
- Provide multiple approaches to building multispecies relationships, including culturally diverse exemplars, different sensory and embodied experiences, and various discourse patterns and activity structures. These human-nature engagements support wholeness, wellness, and community goals for youths' learning.

Reflection questions

- Reflect on your relationships with human and more-than-human inhabitants of local ecosystems. How can you model for students how to build similar multispecies relationships?
- How are your students currently building sustained relationships with the more-than-human inhabitants of local ecosystems?
- How can you provide learning opportunities to students so that they learn about the interconnectedness and dynamics of ecosystems and how to engineer thriving multispecies communities?

Adapted from: Han, R. and P. Bell. *Using Science Investigations to Develop Caring Practices for Social-Ecological Systems*. STEM Teaching Tools Initiative, Institute for Science + Math Education. Seattle, WA: University of Washington. June 2019. Retrieved from https://stemteachingtools.org/brief/61.

Resource #13

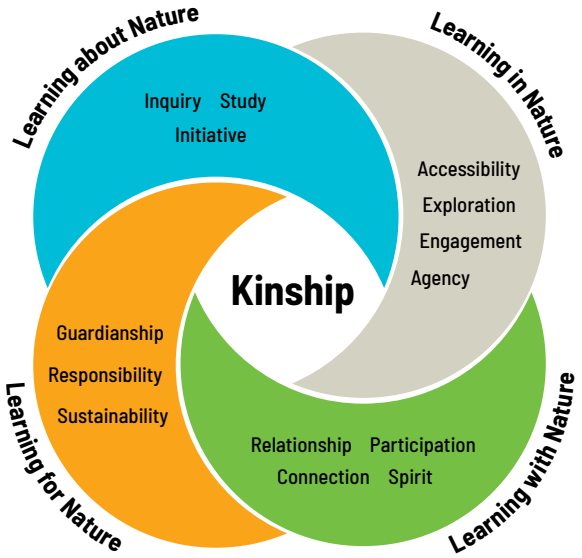
Talking with Children about Climate Change

Developing strategies for talking with children about climate change can be challenging. The following resources provide useful guidance.

- CLEAN, Elementary Teaching Strategies. *Climate! How Do I Teach this Complex, Controversial, and Challenging Topic to My Elementary Students?* 2023.
  Retrieved from https://cleanet.org/clean/literacy/elementary/strategies/index.html
- Eklund, F.B. and K. Nylen. *Talk to Children About the Climate Crisis: A Guide for Parents and Other Adults.* Our Kids Climate. 2021.
  Retrieved from https://media.ourkidsclimate.org/2021/06/Talk-about-climate-guide-for-parents-2021-06-01.pdf
- Eklund, F.B. and K. Nylen. *Talk to Children About the Climate Crisis: A Guide for Teachers, Educators, and School Leaders*. Our Kids Climate. 2023.
  Retrieved from https://media.ourkidsclimate.org/2022/04/Talk-about-climate-guide-for-teachers-edu-cators-and-school-leaders_2022-03-31.pdf
- Lee, S. *How to Talk With Children About Climate Change*. American Academy of Pediatrics. 2023.
  Retrieved from https://www.healthychildren.org/English/safety-prevention/all-around/Pages/Talking-with-Children-about-Climate-Change.aspx?_gl=1*143eo1w*_ga*MjA0Nzk3MzExOS4xNzA0MjM5MTc1*_ga_FD9D3XZVQQ*MTcwNDIzOTE3NS4xLjAuMTcwNDIzOTE3NS4wLjAuMA..
- NRDC. *Your Guide to Talking with Kids of All Ages About Climate Change*. 2019.
  Retrieved from https://www.nrdc.org/stories/your-guide-talking-kids-all-ages-about-climate-change
- UNICEF. *Talking to Your Child About Climate Change*. n.d.
  Retrieved from https://www.unicef.org/parenting/talking-your-child-about-climate-change
- Chicago Academy of Sciences, Peggy Notebaert Nature Museum. *Talking to Kids about Climate Change*. 2023.
  Retrieved from https://naturemuseum.org/science-research/sustainability-resources/talking-to-kids-about-climate-change/
- Simmons, D. *How to Talk with Kids about Climate Change*. Yale Climate Connections. 2020.
  Retrieved from https://yaleclimateconnections.org/2020/08/how-to-talk-with-kids-about-climate-change/

Environmental Kinship Guide

Environmental Kinship International produced the Environmental Kinship Guide to address the often-unacknowledged development of skills and understanding needed to address climate change. The authors shared "the desire to step forward into a more inclusive practice that embraces the observable and the unobservable experiences of being with the natural world." Although this work focuses on the early years of development, when many attitudes and behaviors are formed, it can be more broadly applicable to the types of learning needed to face climate change in our communities. The authors, representing the United States, Scotland, and New Zealand, worked with reviewers from many different backgrounds and programs to focus on the essential learning that happens in, with, about, and for nature. The focus of kinship is on the deep relationship between humans and the rest of nature, which is foundational to the action needed to protect and promote sustainable action, including addressing climate change.



For more information and to download *The Environmental Kinship Guide*, visit https://environmentalkinship.org/

Resource #14

Great Climate Change Resource Collections

There are hundreds of curriculum and activity guides focused on climate change. Accessing quality teaching resources can be a challenging task, however. And once you find seemingly appropriate classroom activities, how do you determine if they are reliable, scientifically accurate, and educationally sound? The following accessible, curated collections of climate education material can help you sort through the possibilities.

CLEAN: Climate Literacy & Energy Awareness Network
The CLEAN Collection is a curated compilation of climate and energy education teaching resources. All the teaching materials posted in the CLEAN Collection have been rigorously vetted through a peer-review process by scientists and educators.

The CLEAN Collection includes activities, videos, visualizations, and simulations that are:

- Accessible online through a searchable database
- Free
- Classroom ready
- Aligned with the Next Generation Science Standards, Climate Literacy Framework, and Energy Literacy Framework
- Designed for K–12 teachers, college instructors, and informal educators

CLEAN offers instructional support, guidance for teaching climate and energy science principles, resources for families, unit planning tools, and strategies for managing controversial issues in the classroom.

For more information about CLEAN, visit https://cleanet.org/index.html.

NOAA Resource Collections
NOAA's Education Resource Collections portal is designed to help educators easily access classroom-ready instructional materials and data resources. Through the portal, educators can find lesson plans and activities, multimedia, and background information to assist in understanding related contexts and systems, career profiles, and feature articles. In addition, the collection features data from NOAA's Earth monitoring, modeling, and measurement systems. Some resources are designed specifically for educators, while others are for researchers.

Materials selected for this site are organized by themes, collections, and content types aligned with common teaching topics and expressed needs of educators. Collections of linked resources provide the user with a toolkit of materials and activities suitable for integration into various educational settings. All linked materials are free for use and distribution unless expressly noted.

For more information and to access the collections, visit noaa.gov/education/resource-collections.

Subject to Climate
Subject to Climate is a curated, online collection of K–12 teaching resources, including curriculum materials, audiovisual media, data, interactive media, and scientific reports. Resources span subject areas and are searchable by grade level. These materials are made available at no cost. In addition to teacher-produced lesson plans, Subject to Climate offers teaching tips, scientist notes, and alignment to national standards. Several states, including Maine, New Jersey, Oregon, and Wisconsin, have posted state-specific resource hubs.

For more information and to access Subject to Climate, visit https://subjecttoclimate.org/.

You may also find the following resources useful.

• Climate Generation. Resource Library. n.d. Retrieved from https://climategen.org/resources/
• EPA. *Climate Change Resources for Educators and Students*. 2023. Retrieved from https://www.epa.gov/climate-change/climate-change-resources-educators-and-students
• NASA Global Climate Change. Vital Signs of the Planet. *For Educators*. 2023. Retrieved from https://climate.nasa.gov/for-educators/
• NOAA. Climate.gov. *Toolbox for Teaching Climate and Energy*. n.d. Retrieved from https://www.climate.gov/teaching/toolbox

Environmental Justice Activity Guides

Introduction to Environmental Justice

EcoRise, in collaboration with Groundwork USA, developed Introduction to Environmental Justice to be used with elementary, middle, and high school students. It focuses on developing an understanding of environmental justice history and concepts:

> *Each lesson facilitates students' exploration of how kindness, compassion, and empathy can contribute to repairing damage caused by racist behaviors, policies, and systems. Students learn that harming the environment is an example of unkind behavior and that people of color are disproportionately impacted by environmental problems. At each grade level, students take a close look at leaders and events that helped form the EJ movement and discuss how they can help dismantle/counteract damage caused by systemic racism. They explore examples of EJ Heroes—activists who have addressed environmental justice problems in their communities—and begin exploring how they can be EJ heroes, too. At the upper grades, students are challenged to look at specific examples, such as the unequal distribution of resources and the "Not in My Backyard"(NIMBY) effect. Then, students will explore solutions through role-playing political strategies, learning about EJ policies, and participating in a policy-writing workshop.*

Lesson plans are aligned with the Common Core State Standards (CCSS) and the Next Generation Science Standards (NGSS) and emphasize critical thinking skills. Lessons also include student worksheets and illustrated posters.

Introduction to Environmental Justice can be ordered through https://www.ecorise.org/product/intro-to-ej/#:~:text=Through%20engaging%20lessons%20and%20activities,disproportionately%20impacted%20by%20environmental%20problems.

Learners to Leaders: Environmental Justice Literacy Curriculum

Groundworks USA developed the Learners to Leaders Environmental Justice Literacy Curriculum for use with middle and high school students and adults. According to the authors,

> *The curriculum aims to improve environmental justice literacy by providing an overview of the history of environmental justice—looking at the intersection between environmental and civil rights movements in America—and helping students to connect this history with current events (and injustices) in their own communities. Students learn how to study specific environmental justice issues and actively address them. In addition, the curriculum supports development of research and critical thinking skills and can satisfy educational standards (relevant standards are highlighted throughout the text).*

Lesson plans include guiding questions, tips, resource links, and alignments for the Common Core Standards, Next Generation Science Standards, and the 21st Century Skills Framework for Learning.

You can download *Learners to Leaders* at https://urbanwaterslearningnetwork.org/wp-content/uploads/2020/02/GWUSA_Env_Literacy_Curriculum_2019.pdf

You might also find these resources useful.

- California Coastal Commission. *Environmental Justice in California and Beyond (Grades 9–12)*. 2022. Retrieved from https://www.coastal.ca.gov/publiced/directory/Environmental_Justice_in_California_and_Beyond.pdf
- Haley, J., et al. *Right Here! An Educator's Guide for Equitable Climate Action in the Upper Valley and Beyond*. Shelburne, VT: Shelburne Farms. 2023. Downloaded from PEERassociates.net or bit.ly/equitableclimateaction.
- InTeGrate. *Environmental Justice in the Context of Sustainability*. Science Education Resource Center at Carleton College (SERC). 2023.
  Retrieved from https://serc.carleton.edu/integrate/teaching_materials/themes/societal_justice/EJ.html
- Just Health Action. *JHA Curriculum Material*. 2023.
  Retrieved from http://justhealthaction.org/resources/jha-curriculum-material/
- Zinn Education Project. *Teach Climate Justice Campaign,* 2023.
  Retrieved from https://www.zinnedproject.org/campaigns/teach-climate-justice

Resource #15

Tips for Addressing Climate Anxiety in Youth

By now, many of us have experienced the impacts of climate change like wildfires, floods, drought, heat waves, storms, and more. These experiences make it vital to talk to young people about climate change, but they can also make it more challenging, as the topic is linked to traumatic experiences and anxiety.

Here are a few tips to talk about climate change with young people in a trauma-informed way, whether you are an educator, parent, or anyone else.

Talk about it!
Discussing climate change is hard. We want to protect children from scary topics, and we may feel ill-equipped to have difficult conversations. But climate (mis)information is everywhere, often leaving children with the impression that it is too late for action or that their future will be bleak.

Youth need trusted adults to share information in an age-appropriate way, and talking about trauma is an important way to address it. You can start by allowing young people to share what they know, ask questions, and express their feelings.

Make room for difficult feelings and emphasize coping strategies.
School can sometimes feel like a place where big feelings are not welcome, especially for older children. Prior to bringing up potentially traumatic topics, it is important to build a classroom or home culture where feelings are discussed, acknowledged, and validated. Preview that discussions of these topics may bring up strong emotions, and invite children to share their feelings with the class, a partner, you, or another trusted adult. Share ways to cope with these feelings, like taking action, making a plan for future disasters, limiting news consumption, and maintaining a sense of wonder and connection to the environment by making art, writing, and spending time in nature.

Emphasize solutions and action.
Having agency and power to make change is a vital antidote to trauma, including climate anxiety. Push climate conversations beyond the science and emphasize the action being taken to protect our futures. Ensure that young people know about local climate action plans and youth climate action by sharing stories of youth and adults working to fight climate change (SEI's Green Careers Webinar Series has plenty of these). Find out what is happening in your city, and connect young people to ongoing climate action.

SEI's curriculum resources are designed to focus on solutions, like sustainable design and green technology. Many of SEI's curriculum resources, such as our air quality module, also provide opportunities for students to engage in climate action projects or create plans to reduce their school's resource use. Our People and Planet Challenge provides students with an opportunity to build an advocacy campaign.

Look for signs of distress, and know your limits.
Pay attention to how students react to these discussions, looking out for noticeable anxiety, disruptive behavior, apathy, physical discomfort, fear, or withdrawing from interaction with others. Parents can also look for symptoms like trouble sleeping or obsessive thinking. When these problems arise, ask for help by referring a student to a school psychologist or counselor, connecting with a student's family, or talking with your child's doctor.

Written by Austen Needleman, Associate Program Manager, SEI.

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Suggestions for further reading:

- American Academy of Child and Adolescent Psychiatry. *Climate Change and Eco-Anxiety in Youth*. March 2022. Retrieved from https://www.aacap.org/AACAP/Families_and_Youth/Facts_for_Families/FFF-Guide/Climate_Change_Eco-Anxiety_Youth-137.aspx
- Bambenek, C. *Talking to Your Kid About Climate Change*. February 17, 2022. Retrieved from https://hothouse.substack.com/p/talking-to-your-kid-about-climate#%C2%A7the-kids-arent-all-right
- Natural Resources Defense Council. *Your Guide to Talking with Kids of All Ages About Climate Change*. December 31, 2019. Retrieved from https://www.nrdc.org/stories/your-guide-talking-kids-all-ages-about-climate-change
- SEI. Energize Schools. *Green Career Webinar Series*. n.d. Retrieved from https://www.energizeschools.org/webinarseries.html
- SEI. Energize Schools. *Project-Based Sustainability Curriculum*. n.d. Retrieved from https://www.energizeschools.org/curriculum.html
- U.S. Department of Health and Human Services. *Tips for Talking to Children and Youth After Traumatic Events: A Guide for Parents and Educators*. n.d. Retrieved from https://www.samhsa.gov/sites/default/files/tips-talking-to-children-after-traumatic-event.pdf



Climate Mental Health

CLEAN has developed a well-regarded set of webpages that focuses on climate mental health, with nine different topics:

- Self-care
- Climate Justice
- Listen and Validate Feelings
- Encourage and Take Action
- Join and Create Community Connection
- Incorporate a Trauma-Informed Approach
- Use Social, Emotional, and Positive Coping Skills
- Move through Grief
- Cultivate Hope and Resilience

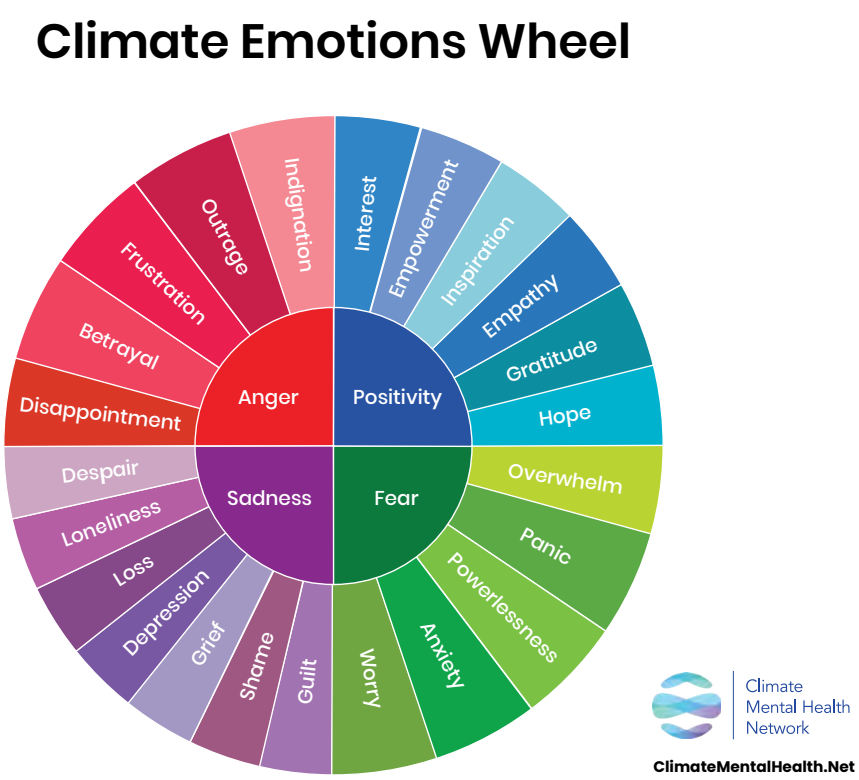
Each topic is supported by a brief description, strategies for addressing the subject, and links to research and teaching resources.

Source: CLEAN, Climate Mental Health. *Beyond Gloom and Doom: How to Teach Climate Change Towards Empowerment.* n.d. Retrieved from https://cleanet.org/clean/literacy/tools/empowerment/index.html

Here are additional resources related to climate mental health you might find interesting.

• All We Can Save Project. Resources for Working with Climate Emotions. n.d.
Retrieved from https://www.allwecansave.earth/emotions
• American Psychiatric Association. Helping Patients Cope with Emotional Reactions to Climate Change: Advice for Mental Health Clinicians. 2023.
Retrieved from https://www.psychiatry.org/news-room/apa-blogs/emotional-reactions-to-climate-change
• Harvard T.H. Chan School of Public Health, C-Change. Mental Health. n.d.
Retrieved from https://www.hsph.harvard.edu/c-change/subtopics/climate-change-and-mental-health/
• International Society for Traumatic Stress Studies (ISTSS). Climate Change and Trauma. 2024.
Retrieved from https://istss.org/public-resources/friday-fast-facts/climate-change-and-trauma
• Yeghoian, A. Introduction to Environmental and Climate Related Trauma and Environmental and Climate Aligned Trauma Informed Practices for Educators and Schools. 2023.
Retrieved from https://docs.google.com/document/d/1-ar77-Eo7SnLVIh35C4cBzG_pAw6kinklkU9_tnju30/edit
• Yeghoian, A. Trauma Informed Nature Connection Activities. 2021.
Retrieved from https://docs.google.com/document/d/1JVYG8VzfwiQ406rcNq-nuzWnjktRUItfK_F6Cfs-P-s/edit

Climate Emotions Wheel



Emotions wheels, also known as feelings wheels or emotional wheels, help individuals identify and label their emotions more precisely. They have been used in psychology, therapy, and self-awareness exercises for decades.

Developed by the Climate Mental Health Network and based on the research of Panu Pihkala,[1] the Climate Emotions Wheel is designed to help individuals and groups articulate and express their emotional responses to climate change and related environmental issues. It aims to capture the wide range of emotions people may experience when thinking about or discussing climate change. The Climate Emotions Wheel consists of a central circle of core emotions, surrounded by an outer circle of spokes representing a more detailed range of emotions. The core emotions are broad categories: anger, positivity, sadness, and fear. The outer spokes include more specific feelings like outrage, inspiration, empathy, gratitude, panic, anxiety, loss, grief, and betrayal.

This wheel can be helpful in conversations and workshops related to climate change, allowing individuals to better articulate and explore their feelings about the subject. It can also be a starting point for developing coping strategies, building resilience, and fostering a sense of agency in addressing climate-related challenges.

The *Climate Emotions Wheel Activity Sheet*, published by the Climate Mental Health Network, provides a tool for exploring climate emotions with people of all ages, https://www.climatementalhealth.net/_files/ugd/d424e1_71802b234f66479c80d6780e885e9960.pdf

Access more information through the Climate Mental Health Network, including resources on Affirmations for Climate Emotions, Well-Being Tips, and Taking Action and Self Care Worksheets, https://www.climatementalhealth.net/resources

[1] Pihkala, P. *Toward a Taxonomy of Climate Emotions*.2022. Front. Clim. 3:738154. doi: 10.3389/fclim.2021.738154

Resource #16

Balancing Hope and Threat

Central to the challenge of effective climate communication is recognizing the tension between messages signaling the threat of the climate crisis and messages signaling hope. Focusing exclusively on the threats posed by climate change produces feelings of hopelessness and despair in audiences that might otherwise be receptive to hearing about the need for action and thus are potentially willing to act.

Climate Access, a U.S.-based group that focuses on effective communication and engagement, suggests keeping the following in mind when developing communication strategies:

1. ***Perceived threats influence people differently.***
2. ***Threats can heighten concern but hinder action.***
3. ***Foster hope by presenting an achievable vision.***
4. ***Outline specific ways your audience can make a difference.***
5. ***Use success stories and real-life examples to prove what's possible.***

Source: Climate Access. *Tip Sheet: Balancing Hope and Threat*. April 2018.
Retrieved from https://climateaccess.org/resource/tip-sheet-balancing-hope-and-threat

To learn more about balancing climate hope and threats, these are excellent resources worth exploring.

- Ballew, M. et al. *Is distress About Climate Change Associated with Climate Action?* Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication. 2023.
  Retrieved from https://climatecommunication.yale.edu/publications/distress-about-climate-change-and-climate-action/
- Bennett, L. *Can Empathy Help Stop Climate Change?* Greater Good Magazine. April 17, 2014.
  Retrieved from https://greatergood.berkeley.edu/article/item/can_empathy_stop_climate_change
- Hellman, C. *The Science and Power of Hope*. TEDx Oklahoma City. July 21, 2021.
  Retrieved from https://www.youtube.com/watch?v=qt0fRSx5Kl4
- Corbin, J., et al. *Climate Education That Builds Hope and Agency, Not Fear. Eos*. August 9, 2023.
  Retrieved from https://eos.org/opinions/climate-education-that-builds-hope-and-agency-not-fear
- Goodman, A. *Need Hope? Tell Stories*. The Goodman Center. February 5, 2024.
  Retrieved from https://www.thegoodmancenter.com/blog/need-hope-tell-stories/
- Ring, W. *Inspire Hope, Not Fear: Communicating Effectively About Climate Change and Health. Annals of Global Health*. Vol. 81, No. 3, 2015.
  Retrieved from https://climateaccess.org/sites/default/files/Ring_Inspire%20Hope%2C%20Not%20Fear.pdf
- Stevenson, K. and N. Peterson. *Motivating Action Through Fostering Climate Change Hope and Concern and Avoiding Despair Among Adolescents*. Sustainability. 2015.
  Retrieved from https://climateaccess.org/sites/default/files/Stevenson_Motivating%20Action.pdf

The Hope Wheel

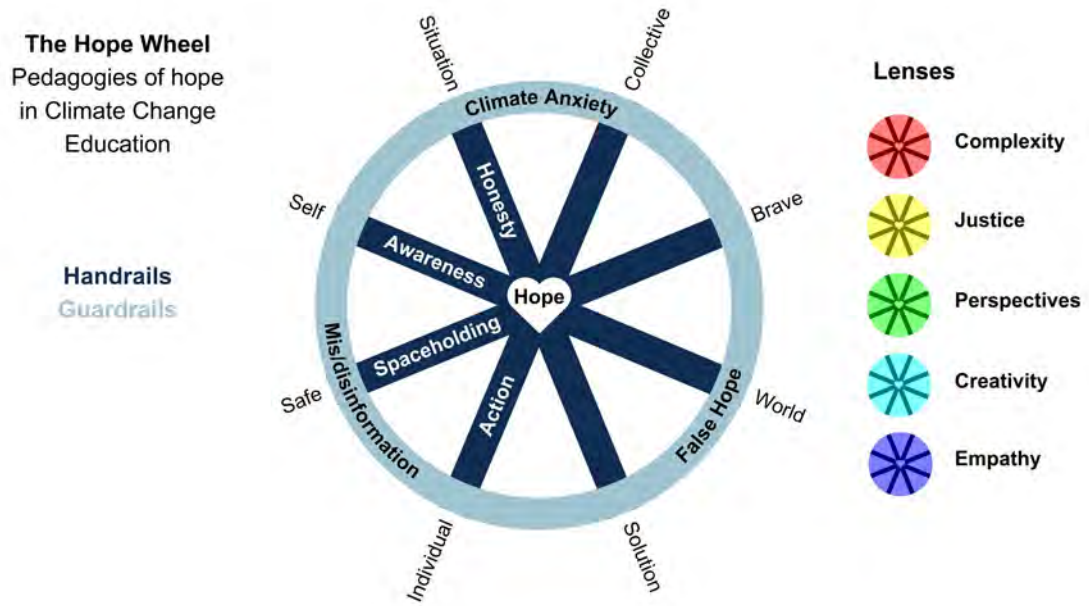


Figure 1. The Hope Wheel: handrails (spokes), guardrails (rim) and lenses to enable hope-based pedagogy in Climate Change Education.

Researchers in the UK developed the Hope Wheel to help educators incorporate climate hope into their teaching. This model synthesizes climate education theory and research, as well as experience in curriculum design and teaching, into the following tips:

- Handrails: Concepts for educators to hold on to, including honesty (about the situation and solutions), awareness (of self and world), spaceholding (safe and brave spaces), and action (individual and collective);
- Guardrails: Concepts for educators to be aware of as things to avoid, including climate anxiety, mis/disinformation, and false hope; and
- Lenses: Integrating concepts that provide new insights on educating for hope, including complexity, justice, perspectives, creativity, and empathy.

Handrails—or spokes in the climate wheel—need to be balanced. For example, "telling the truth" about climate change in a way that focuses on the problem more than the solution can lead to anxiety and doomism, while downplaying the seriousness of the problem and focusing only on solutions can lead to techno-optimism and false hope.

Source: Finnegan, W. and C. d'Abreu. *The Hope Wheel: A Model to Enable Hope-Based Pedagogy in Climate Change Education*. Frontiers in Psychology. 15:1347392. 2024. https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2024.1347392/full

If you want to learn more about pedagogies of hope, see the following:

• Macy, J., & C. Johnstone. *Active Hope: How to Face the Mess We're in with Unexpected Resilience and Creative Power* (First revised edition). New World Library. 2022.
• Ojala, M. *Hope and Climate Change: The Importance of Hope for Environmental Engagement Among Young People*. Environmental Education Research, 18(5), 625–642. 2012. https://doi.org/10.1080/13504622.2011.637157
• Orr, D. *Optimism and Hope in a Hotter Time*. Conservation Biology, 21(6), 1392–1395. 2007. https://doi.org/10.1111/j.1523-1739.2007.00836.x
• Snyder, C. *Hope Theory: Rainbows in the Mind*. Psychological Inquiry, 13(4), 249–275. 2002. https://doi.org/10.1207/S15327965PLI1304_01

Written by Bill Finnegan, Researcher, Education and Training for the Climate (ETC) at the University of Oxford.

Resource #17

Tools for Identifying Local Environmental Impacts

As you delve more deeply into your investigations, these resources could be particularly useful in identifying which populations and communities are most affected by climate change and how. Each tool allows you to search for information about your local community using your zip code or address/city/county.

Cleanups in My Community

Cleanups in My Community (CIMC) is a public web application that provides access to site-specific information from the U.S. Environmental Protection Agency's (EPA) cleanup programs. CIMC allows users to map and list hazardous waste cleanup locations and grant areas. CIMC uses data from the EPA's Facility Registry Service.

Access CIMC at https://www.epa.gov/cleanups/cleanups-my-community

Climate and Economic Justice Screening Tool (CEJST)

CEJST uses an interactive map to indicate communities that face significant burdens related to climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development.

Access CEJST at https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5

EJScreen: Environmental Justice Screening and Mapping Tool

EJScreen is a mapping tool created by the U.S. Environmental Protection Agency (EPA) that uses publicly available data (e.g., air toxics risk data, demographics) to create indices. These indices help identify communities that may experience higher environmental burdens than neighboring communities.

Access EJScreen at https://www.epa.gov/ejscreen

EnviroAtlas

EnviroAtlas is a free online mapping and decision tool developed by the U.S. Environmental Protection Agency (EPA) and partners. It's an interactive web-based tool that can inform policy and planning in places where people live, learn, work, and play. EnviroAtlas provides interactive tools and resources for exploring the benefits people receive from nature. It incorporates data from federal, state, community, and non-governmental organizations.

Access the EnviroAtlas at https://www.epa.gov/enviroatlas

MyEnvironment

My Environment is an online dashboard developed by the U.S. Environmental Protection Agency (EPA). You can use My Environment to enter a location, such as an address, zip code, city, or park name to discover the quality of local air and water, the production and consumption of energy by source, and the presence of toxic air pollutants and greenhouse gases. You can also view facilities and sites regulated by the EPA.

Access MyEnvironment at https://enviro.epa.gov/myenvironment/

Additional online tools worth investigating:

- Climate Central. *Surging Seas*. 2021. Retrieved from https://sealevel.climatecentral.org/maps/
- FEMA. *Community Disaster Resilience Zones*. 2023. Retrieved from https://www.fema.gov/partnerships/community-disaster-resilience-zones
- First Street Foundation. Risk Factor. *What Will Climate Change Cost You?* n.d. Retrieved from https://riskfactor.com/
- Headwaters Economics. *Neighborhoods at Risk*. n.d. Retrieved from https://nar.headwaterseconomics.org/
- National Integrated Heat Health Information System. *Drought.gov*. n.d. Retrieved from https://www.drought.gov/
- National Integrated Heat Health Information System. *Heat.gov*. n.d. Retrieved from https://www.heat.gov/
- NOAA Climate.gov. *Tools and Interactives*. n.d. Retrieved from https://www.climate.gov/maps-data/tools-interactives
- NRDC. *Climate Change and Health: Air Quality*. n.d. Retrieved from https://www.nrdc.org/resources/climate-change-and-health-air-quality#/map?cities=show
- U.S. Climate Resilience Toolkit. *Climate Explorer*. 2021. Retrieved from https://toolkit.climate.gov/tool/climate-explorer-0
- U.S. Climate Resilience Toolkit. *Social Vulnerability Index*. 2021. Retrieved from https://toolkit.climate.gov/tool/social-vulnerability-index
- U.S. Climate Vulnerability Index. 2023. Retrieved from https://climatevulnerabilityindex.org/
- Washington Post. *More Dangerous Heat Waves are on the Way: See the Impact by Zip Code*. 2022. Retrieved from https://www.washingtonpost.com/climate-environment/interactive/2022/extreme-heat-risk-map-us/

Resource #18



Expanding Your Reach – Identifying Frontline Representatives

It is safe to say that almost everyone in your community is experiencing the impacts of climate change. As you think about your community and who should be involved in your efforts, you may be tempted to look first to those well-known to you—people and organizations already within your networks. However, reaching beyond networks and developing new partners and collaborators is important. This includes those who may have been left out of previous efforts, such as frontline communities.

Frontline communities experience the "first and worst" consequences of climate change. They are often communities of color, Indigenous, and low-income, and located in neighborhoods highly exposed to climate impacts like flooding.

You may still need to develop connections to these communities. Luckily, Climate Ready Communities has developed excellent resources focused on the community climate-resilience planning process. Specifically, they offer the following advice on identifying frontline representatives:

- **Form a Focused Committee:** When the timing and available resources allow, help catalyze the formation of an independent, ongoing committee that is focused on equity issues and comprised of frontline community members.
- **Find Informal Leaders:** Look for civic and neighborhood leaders who people trust and turn to for information.
- **Identify Invested Individuals:** During public community and local government meetings, identify the individuals who are most engaged (in a productive manner).
- **Identify Representative Groups:** Attend community or local NGO meetings that focus on neighborhoods or underserved or vulnerable groups. Once trust is established, and it may take attending several meetings, ask about potential frontline representatives; be clear about what you're offering in terms of support to address their concerns.
- **Connect with other agencies:** Inquire with social services agencies of the city, county, and state. Also ask local economic development, parks and recreation departments, and others whose mission includes community engagement.
- **Ask All [Interested Parties]:** Ask for suggestions on who could be an effective representative for communities that experience the first and worst consequences of climate change.
- **Find Proxies Where Needed:** When representatives directly from the affected groups are not available, such as with individuals experiencing homelessness, consider finding a proxy.

Source: GEOS Institute. Climate Ready Communities. Identifying Representatives of Frontline Communities. 2023. Retrieved from https://climatereadycommunities.org/resilience-resources/identifying-representatives-of-frontline-communities/

Fundamental Best Practices for Community Engagement

According to WE ACT for Environmental Justice:

> *Full and transparent community engagement is necessary to ensure just and equitable policies and project implementation, especially given the historical and current marginalization of environmental justice communities.*
>
> *Engagement is not merely community involvement: True engagement fully incorporates the community into all facets of the decision-making process.*

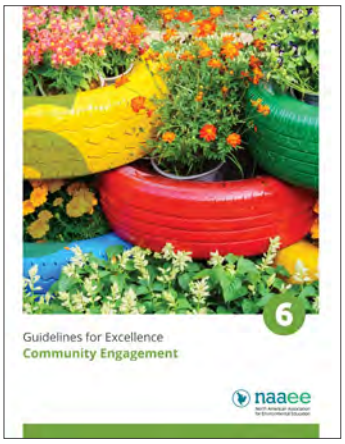
In their Community Engagement Brief, WE ACT outlines four Fundamental Best Practices for Community Engagement:

1) *Identify all communities that could be directly or indirectly affected by the proposed policy or project.*
2) *Go beyond the minimum requirements of the legislation and establish a cohesive framework for stakeholder outreach.*
3) *Make every effort to maximize community participation.*
4) *Build trust by fully documenting and publishing all community engagement interactions and exchanges.*

In addition to the Fundamental Best Practices for Community Engagement, the WE ACT brief includes detailed sections called Environmental Justice Analyses, Community Benefits Agreements, and Public Participation within the NEPA (National Environmental Policy Act) Process.

Source: WE ACT for Environmental Justice. *Community Engagement Brief*. 2022. Retrieved from https://www.weact.org/wp-content/uploads/2022/10/Community-Engagement-Brief-092322-FINAL.pdf

Community Engagement: Guidelines for Excellence



Community Engagement: Guidelines for Excellence, from NAAEE, focuses on community wellness and helps educators create inclusive environments that support effective partnerships and collaborations. These guidelines are organized around five key characteristics that provide a high-level framework for working with communities. Education that successfully engages communities is:

- Community Centered
- Based on Sound Environmental Education Practices
- Collaborative and Inclusive
- Oriented Toward Capacity Building and Civic Action, and
- Based on a Long-Term Investment in Change.

A 25-item toolkit augments the guidelines; toolkit resources help users dive more deeply into aspects of environmental education and community engagement that may be unfamiliar to some practitioners. These supporting resources delve into Community Well-Being, Sustainability, and Resilience; Organizational and Professional Readiness for Community Engagement; Community Readiness for Change; Collaborative Leadership; Addressing Conflict; Appreciative Inquiry; Designing Civic Engagement, and more.

Community Engagement: Guidelines for Excellence can be considered a companion piece to these guidelines.

Simmons, B. et al. *Community Engagement: Guidelines for Excellence.* Washington, DC: NAAEE. 2017. Retrieved from https://naaee.org/eepro/resources/community-engagement-guidelines

Community Inventory List

Earth Force developed this community inventory as part of their Environmental Action Civics model. Designed for use with youth, learners conduct an inventory to assess their community for environmental strengths and concerns.

Community Inventory List
The following is a list of possible inventories to help us understand community concerns. Remember, an inventory is inquiry-driven, collects some kind of data, and leads to a list of strengths and concerns of the defined community.

Note: *Earth Force advocates for conducting at least three inventories: one that is* ***numbers-based*** *data, one with* ***descriptive*** *data, and at least one that is* ***justice-focused*** *(noted with a ✪). Bonus if* **students design***!*

Inventory	Examples
✪ **Surveys**	Create a school/peer/community survey or poll. Consider different formats: written, digital, or verbal. Consider asking questions like "Who is the most affected by…?" "Do certain groups feel the consequences of X more than others?"
✪ **Audits & Assessments**	Complete audits of energy use, recycling, carbon footprints, food waste and access, walkability, canopy cover, etc. Assess how well systems and processes are working within the community.
Review Policies & Practices	Identify city/county ordinances and analyze topographical maps & evaluate adherence to policy. Invite local policy makers to participate in a panel; use observational studies to determine community practices.
✪ **Interviews**	There are two groups of people who are excellent to interview: Local Experts, and Knowledge Holders. Look for local experts or persons who are directly involved with a concern like city planners, school administration, and other stakeholders. Invite them into your classroom or interview them by phone. Also consider people who hold community knowledge, like faith-based leaders, grassroots organizations, social service providers, and people who have lived in your community for a long time. This group will be able to shine a light on environmental and social inequities in your community.
Online Databases	Use online databases to investigate concerns and/or help with determining project approaches. Government and other agency websites have public information that can help your students! EarthForceResources.org website is filled with links to such databases as well.
✪ **Maps**	Use maps to identify local facilities (energy plants, waste treatment facilities, etc.); collect data based on particular areas; analyze topographical maps & evaluate adherence to policy; and get more information about your community. Story and GIS maps are a fun and interactive way to collect information too. Note, there are excellent maps that focus on justice-issues, including Redlining, Brownfield, and Ecojustice maps.

continued on the following page

Community Inventory List

Inventory	Examples
Guided Walking Tours	Take a walk! Educators and/or experts can guide students through their community and ask driving questions to stimulate thought and discovery. Identify community boundaries and look for strengths and concerns.
News & Media Search	Look at local media in the recent past and make a list of concerns they see mentioned; summarize the concerns and what the community is doing about them. Make sure sources are credible!
Data Collection	Get out in the field and collect samples; test the health of air/water/soil; sample macroinvertebrates or biodiversity; try observational studies of community practices.
Other Ideas?	Add your own!

Additional inventory resources (including those specific to flooding and water quality) can be found at https://earthforce.org/

GUIDELINES IN PRACTICE

Re-Thinking Food

Located 50 miles southeast of downtown Los Angeles, Riverside Unified School District (RUSD) established an innovative, integrated farm-to-school model. RUSD's model connects students with local agriculture, provides nutrition education, and supports neighboring farmers. They operate a Central Kitchen and Food Hub that prepares and delivers food to all 30 RUSD elementary schools, each with its own fresh and locally grown salad bar. The Riverside Food Hub also provides nutrition education to students in several school districts and the local community.

In the early 2000s, the idea of a "Farmers Market Salad Bar" began with a single RUSD school site and an initial investment of $10,000. The Food Hub launched in 2017 with funding secured by the California Department of Food and Agriculture. Now, the Riverside Food Hub sources produce from more than 20 farmers within a 100-mile radius and services the entire community, not just schools. It is the first produce distribution arrangement to be operated by a school district "People come from all over the world to learn about our work," says Adleit Asi, RUSD nutrition services director.

The Food Hub is a vital part of RUSD's efforts to increase the amount of fresh, locally grown food, resulting from California's School Meals for All Act, which provides free breakfast and lunch for all K–12 public school students. More than 200 supporting organizations, including the Center for Ecoliteracy and its California Food for California Kids initiative, support this policy. This network connects over 100 districts across the state, providing resources for schools, food service professionals, educators, and families to transform school food systems and how students learn about the food they eat.

Why It Works:

- The RUSD farm-to-school model supports the triple bottom line of sustainability. Its integrated approach grows knowledge of local food and environmental systems, generates opportunities for community and economic development, and advances public policy related to food and agriculture. "The importance of buying local produce supports the local economy, which in turn supports the tax base, which supports the school district and creates jobs for local farmers," says Scott Berndt, RUSD Central Kitchen and Food Hub manager.
- Institutionalized policies and programs continue to support and invest in the RUSD model. In 2021, California became the first state to permanently provide free meals to all K–12 public school students. So not only is the school food fresher and more local but it's also provided to students for free.

continued on the following page

GUIDELINES IN PRACTICE

Re-Thinking Food

A pillar of viable farm-to-school networks is peer-to-peer learning. These networks create avenues to share resources and lessons learned. Staff from other districts visit RUSD to learn how to build or expand their own farm-to-school programs. “Rethinking food every time you have lunch is an opportunity for education. It just doesn’t happen in the classroom; it’s in the lunchroom,” says Moises Munoz Plascencia, Santa Ana’s Farm-to-School coordinato

To learn more about the RUSD Farm-to-School program:

- Center for Ecoliteracy: https://www.ecoliteracy.org/
- California Food for California Kids: https://www.californiafoodforcaliforniakids.org/
- Riverside Food Hub: https://www.riversideunified.org/departments/nutritionservices/food_hub
- Grow Riverside & Beyond: https://growriv.com/

Resource #19

Using Local Phenomena to Communicate Climate Solutions

What Is the Issue?

Communicating why we should respond to climate change is no longer enough. Climate science communication must be grounded in the actions of nearby communities. Focusing on local phenomena (e.g., sea level rise and flooding in New Orleans) and local responses allows individuals to envision solutions appropriate for their own community—fostering collective agency and collaborative decision-making among local governments, nonprofits, businesses, and the public.

Things to Consider

- When scientists communicate about climate change, solutions often seem distant and abstract to community members—even when the community involved is one of those most heavily impacted by climate change (e.g., young people and low-income communities of color).
- Moving towards solutions-centered climate communication (and away from reiterating decontextualized scientific facts) can alleviate climate anxiety and despair and promote agency. Focusing on local community responses allows individuals to make personal connections to climate change in positive and constructive ways rather than dwelling on it as a looming disaster. When climate change feels personal, urgent, and close to home, peoples' beliefs, values, and identities change to make informed decisions.
- Because the impacts of climate change vary, it is necessary to communicate with the specific needs, values, and resources of each community or person in mind. Additionally, within each community, many decisions are not made based on scientific findings alone but on interpretations of those findings within social and cultural contexts. As communities make decisions about complex transdisciplinary issues like climate change, contributions from experts outside your established network are necessary to maintain locally relevant adaptation and mitigation responses. Collaborate with local leaders, tribal nations, and others who live and work in the community to craft communications. Their place-based knowledge is essential.

Recommended Actions You Can Take

- Explore the examples of local climate change response efforts in the American Association of the Advancement of Science (AAAS) resource "How We Respond," including videos and narratives from around the United States. These examples demonstrate how communities can adapt to and mitigate climate change using scientific knowledge and expertise from diverse backgrounds and lifeways. These stories also show the power of story-based communication.
- Continue to listen to and understand how communities are talking about climate change. Many Indigenous communities have been communicating and responding to climate change in innovative ways that Euro-Western knowledge systems do not account for. Growing a network of collaborators with diverse cultural, community, geographic, and educational backgrounds can help keep your climate communication grounded in local needs and ways of relating to it.
- Stay involved with local climate change response efforts like the Sunrise Movement and 350.org to increase your familiarity with local phenomena and build relationships through which you can create action.

Attending to Equity

- Low-income communities of color are disproportionately affected by climate change yet often excluded in decision-making for climate resilience. Intersecting systems of oppression (e.g., antiblackness, settler colonialism, racism, heteropatriarchy, poverty, ableism, etc.) limit access to necessary resources and protections for climate change adaptation and planning.
- It is important to know how to meaningfully integrate a variety of knowledges, expertise, and practices in climate change decision-making in ways that support local communities' interests, needs, and well-being.

Adapted from: Guevara, C., E. Kimbrell, T. Cloyd, T. Lohwater, and A. Rhinehart. *Using Local Phenomena to Communicate Climate Solutions*. STEM Teaching Tools Initiative, Institute for Science + Math Education. Seattle, WA: University of Washington. April 2021. Retrieved from https://stemteachingtools.org/brief/69

Real Talk about Climate Change

Talking with others about climate change and climate change solutions isn't necessarily intuitive. Thankfully, there are resources that provide helpful advice, including the straightforward set of principles of REAL TALK offered by the people at Climate Outreach and EIT Climate-KIC:

- ***R**espect your conversational partner and find common ground.*
- ***E**njoy the conversation.*
- ***A**sk questions.*
- ***L**isten and show you've heard.*
- ***T**ell your story.*
- ***A**ction makes it easier (but doesn't fix it).*
- ***L**earn from the conversation.*
- ***K**eep going and keep connected.*

For each principle, the authors give a short description or explanation and suggestions. They also recommend useful phrases sample questions that may help move the conversation forward, and ideas for telling your story.

Source: Webster, R. & G. Marshall. *The #TalkingClimate Handbook. How to Have Conversations About Climate Change in Your Daily Life.* Oxford: Climate Outreach.2019. Retrieved from file:///C:/Users/boras/Downloads/Climate-Outreach-Talking-Climate-Handbook-How-to-have-conversations-about-climate-change-in-your-daily-life-v2.pdf

Additionally, the GEOS Institute has produced Climate Conversation Tips with the following suggestions:

1. **Know your audience.**
2. **Address their personal relationship to the environment and climate.**
3. **Explain the science behind climate change.**
4. **Demonstrate the positive impacts of increasing climate resilience.**
5. **Continue the conversation.**

For each of the five steps, they offer specific tips for implementation and links to additional resources.

Source: Geos Institute and Climate Ready Communities. Climate Conversation Tips. 2023.
Retrieved from https://climatereadycommunities.org/resilience-resources/climate-conversation-tips/

Some other resources you might find helpful include:

- Botkin, K. *Red Talk, Blue Talk: Exploring the Political Dialects of a Fractured Nation*. Multilingual. 2023. Retrieved from https://multilingual.com/issues/nov-dec-2020/red-talk-blue-talk/
- Peach, S. and J. Marlon. *How to Talk About Climate Change: Ask Questions.* Yale Climate Connections. November 17, 2021. Retrieved from https://yaleclimateconnections.org/2021/11/how-to-talk-about-climate-change-ask-questions/
- On the Road Media and Frameworks Institute. *Six Ways to Change Hearts and Minds About Climate Change: Climate Stories That Work*. 2020. Retrieved from https://onroadmedia.org.uk/wp-content/uploads/2020/09/Six-ways-to-change-hearts-and-minds-about-climate-change.pdf
- Roberts, F. *Let's Talk About How We Talk About Climate Change*. 2021. Retrieved from https://www.ucl.ac.uk/climate-action-unit/sites/climate_action_unit/files/lets_talk_about_how_we_talk_about_climate_change_-_environment_magazine_-_march_2022_issue.pdf
- The Nature Conservancy. *Let's Talk Climate: A How-To Guide*. 2018. Retrieved from https://www.nature.org/content/dam/tnc/nature/en/documents/lets-talk-climate-ebook.pdf
- United Nations, Climate Action. *Communicating on Climate Change*. n.d. Retrieved from https://www.un.org/en/climatechange/communicating-climate-change

Community Voices, Informed Choices (CIVIC)

Community Voices, Informed Choices (CIVIC) brings together the expertise for working with communities of Florida Agricultural and Mechanical University (FAMU) and the University of Florida (UF), both land grant universities. CIVIC helps communities address complex issues. Through deliberative discussions and town hall meetings, CIVIC activities provide information and engage community members in discussing contentious issues that require community-scale solutions.

CIVIC activities provide science-based information and engage participants in deliberative discussions that lead to increased knowledge of the issue, hearing different perspectives, and identifying actions that lead to community solutions. CIVIC builds on the decades of work by the Kettering Foundation and the National Issues Forum Institute and adds Extension's successful tradition of providing neutral science-based information.

CIVIC activities are designed to do the following:

- Provide research-based information about community issues in ways that help people understand the issue and options, ask questions, and respect differences
- Build partnerships with organizations, agencies, and institutions to enhance civic life and governance
- Develop events (such as town hall meetings and deliberative discussions) that enable a variety of people to hear different perspectives and express their concerns as they seek common ground
- Facilitate small groups of people taking reasonable steps toward identifying, recommending, or implementing solutions to community issues

A successful CIVIC activity is not a debate or arm-wrestling competition. It is a thoughtful expression of options and trade-offs that address an issue and explore why people think some choices might be better than others. This healthy two-way conversation involves understanding the conditions and assumptions that lead people to prioritize different solutions. It helps a community focus on a path forward to address complex issues and invites participants to continue the momentum toward change. It helps people discuss the motivating question, "What should we do?" while generating the energy to begin the next step. However, inviting people to work on issues they care about can create strong feelings and conflicting perspectives. A good facilitator is needed to help the group acknowledge these differences and move toward common ground. Everyone needs to be heard and respected.

What Is a CIVIC Deliberative Forum?

A deliberative forum is a public meeting where attendees talk and listen to each other. They attend because they are concerned about a particular issue. They bring their expertise, values, and perspectives. They listen—deeply—to each other to learn how their ideas are similar to and different from others' ideas. Even though the issue may be relevant to the entire state, or even the nation or planet, the discussion should include opportunities people can imagine implementing in their community. The facilitator carefully guides the group through a discussion of several options, each with specific, community-related actions and potential trade-offs. Facilitation is critical to help set the tone, encourage quiet people to speak, constrain the dominant talkers, and keep the group thinking together. Using a carefully framed issue guide keeps the discussion focused on what people care about the various potential solutions rather than facts about the issue. Toward the end, the facilitator asks whether people see some common ground, a way forward, or a next step they can take.

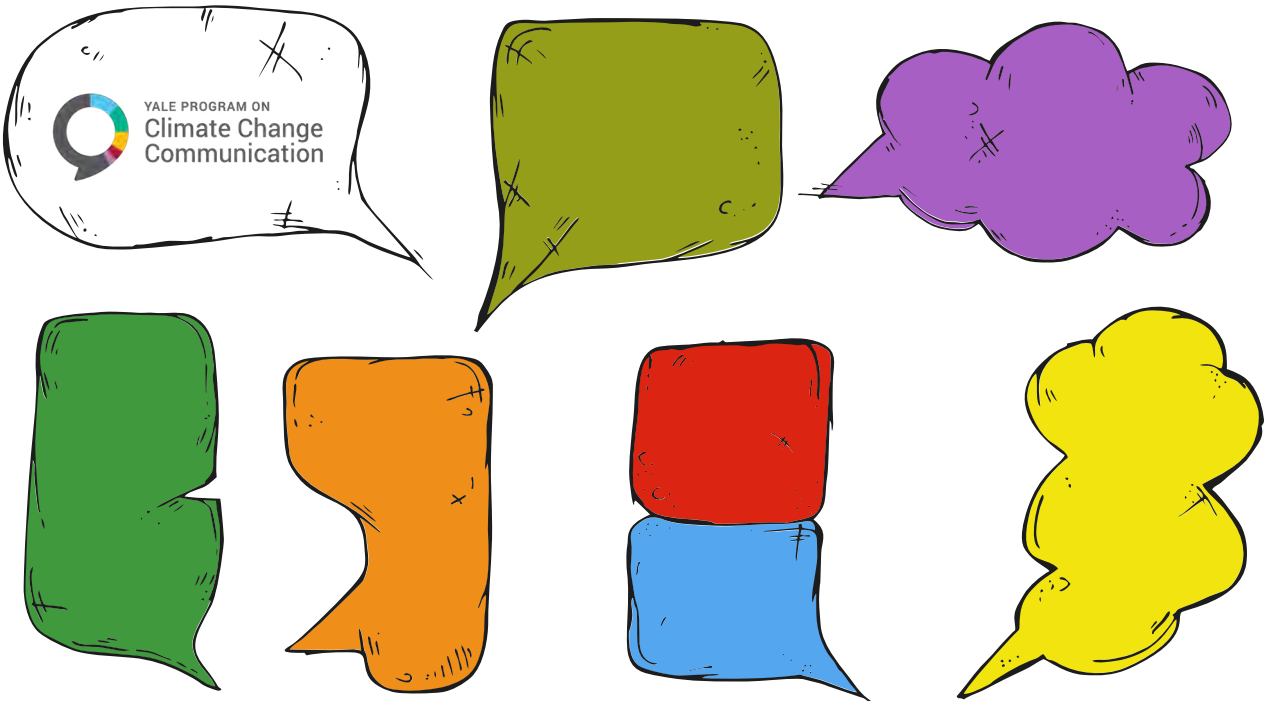
It is also helpful to consider what a deliberative forum is not. It is not a presentation to community members. It is not a debate. It does not typically include decision-makers or their campaign promises. It is not a chance to speak for three minutes, one person after another, with no opportunity to ask questions or explore new ideas. Nor is it a free-form discussion or rant. Community forums democratize the process of engagement outside of the recognized public spaces for community input, i.e., commission meetings. Extension agents observe that forum participants greatly appreciate the opportunity to be heard, leave more knowledgeable and motivated to act, and are willing to continue discussions with other forum participants.

Excerpted with permission from Abeels, H. et al. *CIVIC: Community Voices Informed Choices. A Guide for Helping Communities Address Challenging Issues*. Florida Cooperative Extension Program. 2023. Retrieved from https://programs.ifas.ufl.edu/media/programsifasufledu/civic/docs/CIVIC_Final_11-14-23_Web.pdf

For more information about CIVIC and to access *Climate Choices for Coastal Communities*, a deliberative forum issue guide, visit https://programs.ifas.ufl.edu/civic/

If you would like to learn more about deliberation, these resources may be of interest.

- Environmental Issues Forums, https://naaee.org/our-work/programs/environmental-issues-forums
- Kettering Foundation, https://www.kettering.org/
- National Issues Forums Institute, https://www.nifi.org/



Yale Program on Climate Change Communication

The **Yale Program on Climate Change Communication (YPCCC)** is a research initiative based at the Yale School of the Environment and the Yale Center for Environmental Communication. Its primary mission is to advance our understanding of public opinion on climate change and to communicate climate science and solutions to the public effectively and engagingly. YPCCC is well known for:

- **Climate Opinion Research:** YPCCC conducts extensive research to track public opinion on climate change. They use surveys, polls, and social science research methods to understand how different demographic groups perceive and respond to climate change issues. One of the best-known initiatives is *Climate Change and the American Mind.*
- **Communication Strategies:** YPCCC develops and tests communication strategies to convey climate science and policy information to diverse audiences. They work on refining messaging to make it more accessible and persuasive.
- **Data Visualization:** The program uses data visualization tools and techniques to make complex climate data more understandable and accessible to the general public, policymakers, and the media.
- **Climate Communication Research:** YPCCC conducts research to better understand the role of media, social networks, and various communication channels in shaping public perception and behavior related to climate change.
- **Educational Initiatives:** YPCCC works on developing educational resources and curricula to teach climate change science and solutions in schools and universities, aiming to empower the next generation with the knowledge to address climate challenges.
- **Climate Change Solutions:** YPCCC emphasizes the importance of communicating both the challenges and solutions of climate change. They showcase actionable steps that individuals, communities, and governments can take to mitigate and adapt to climate change.
- **Yale Climate Connections**, a nonpartisan climate news service, daily radio program, and podcast providing original reporting and commentary on climate change.

To learn more about the Yale Program on Climate Change Communication and Climate Change and the American Mind, visit https://climatecommunication.yale.edu/about/projects/climate-change-in-the-american-mind/

Resource #20

Community Engagement and Ownership

Climate action does not take place in a vacuum. Inevitably, there are individuals or groups interested in the outcome of a project or action. These people may be positively or negatively impacted by the project under development. For example, a proposed vehicle idling zone designed to reduce fossil fuel consumption and improve air quality will affect waiting drivers as well as those waiting for a ride. Developing a community garden on park land will affect the recipients of the harvested food, the groundskeepers responsible for maintaining the park, and those who use that land for sports and picnicking.

Consequently, it may make sense to explicitly design an inclusive process to engage community members in the project. According to WE ACT for Environmental Justice,

Inclusive engagement can:

- Uncover important local knowledge and increase understanding of the issues
- Highlight social, cultural, and environmental issues and contexts that will influence the success of the effort
- Honor the knowledge and experiences of people from communities with climate justice concerns
- Reduce or resolve conflicts
- Create new relationships
- Produce better outcomes or decisions
- Develop support for the project

Source: WE ACT for Environmental Justice. *Community Engagement Brief*. 2022. Retrieved from https://www.weact.org/wp-content/uploads/2022/10/Community-Engagement-Brief-092322-FINAL.pdf

Principles of Community Engagement

No one community engagement process meets all needs. The local context, the people involved, their level of expertise, and the availability of resources all make a difference. To help guide you in the process, the following, written for public healthcare workers, details nine principles of community engagement:

Before starting a community engagement effort

1. *Be clear about the purposes or goals of the engagement effort and the populations and/or communities you want to engage.*
2. *Become knowledgeable about the community's culture, economic conditions, social networks, political and power structures, norms and values, demographic trends, history, and experience with efforts by outside groups to engage it in various programs. Learn about the community's perceptions of those initiating the engagement activities.*

For engagement to occur, it is necessary to

3. *Go to the community, establish relationships, build trust, work with the formal and informal leadership, and seek commitment from community organizations and leaders to create processes for mobilizing the community.*
4. *Remember and accept that collective self-determination is the responsibility and right of all people in a community. No external entity should assume it can bestow on a community the power to act in its own self-interest.*

For engagement to succeed

5. *Partnering with the community is necessary to create change and improve health.*
6. *All aspects of community engagement must recognize and respect the diversity of the community. Awareness of the various cultures of a community and other factors affecting diversity must be paramount in planning, designing, and implementing approaches to engaging a community.*
7. *Community engagement can only be sustained by identifying and mobilizing community assets and strengths and by developing the community's capacity and resources to make decisions and take action.*
8. *Organizations that wish to engage a community as well as individuals seeking to effect change must be prepared to release control of actions or interventions to the community and be flexible enough to meet its changing needs.*
9. *Community collaboration requires long-term commitment by the engaging organization and its partners.*

Source: Clinical Translational Science Awards Consortium, Community Engagement Key Function Committee Task Force on the Principles of Community Engagement. *Principles of Community Engagement* (2nd edition). NIH Publication no. 11-7782. Washington, DC: Department of Health and Human Services, 2011. Retrieved from https://www.atsdr.cdc.gov/communityengagement/pdf/PCE_Report_508_FINAL.pdf

Community Engagement: From Information to Ownership

Before you start a project, think about what you want to accomplish with the engagement effort. How do you want to engage community members?

Say that you and your collaborators are working to expand the availability of fresh, nutritious foods that support a plant-rich diet through a community gardening initiative. Do you want to inform community members about the effort and help them understand the basics of nutrition? Do you want to consult community members on where garden plots should be located or on the design of garden plots? Do you want to collaborate with residents in building plots, gardening, teaching gardening skills, or distributing produce? Or do you want to foster a community-driven, community-owned process?

To help you think through these levels of engagement, you can access the *Spectrum of Community Engagement to Ownership* developed by Rosa Gonzalez. Gonzalez expanded upon previous participation tools, including the IAP2 Spectrum of Public Participation, to describe an array of stances that might be taken towards community engagement, ranging from ignore, inform, or consult to involve, collaborate, or defer to.

Gonzalez further describes the impact of each of these stances and its associated community engagement goals. For instance, "Ignore" would be associated with marginalization and a community engagement goal of denying access to the decision-making process. On the other end of the spectrum, "Defer to" would be associated with community ownership and community engagement goals related to fostering "democratic participation and equity through community-driven decision-making."

If you want to learn more about community engagement and ownership, there are excellent resources worth exploring:

- Clinical Translational Science Awards Consortium, Community Engagement Key Function Committee Task Force on the *Principles of Community Engagement*. Principles of Community Engagement (2nd edition). NIH Publication no. 11–7782. Washington, DC: Department of Health and Human Services, 2011. Retrieved from https://www.atsdr.cdc.gov/communityengagement/pdf/PCE_Report_508_FINAL.pdf
- Gonzalez, R. *Spectrum of Community Engagement to Ownership*. Facilitating Power, Salinas, CA. 2020. Retrieved from https://movementstrategy.org/wp-content/uploads/2021/08/The-Spectrum-of-Community-Engagement-to-Ownership.pdf
- Gonzalez, R. *Spectrum of Family & Community Engagement for Educational Equity*. Facilitating Power, Salinas, CA. n.d. Retrieved from https://www.oregon.gov/ode/students-and-family/equity/AfricanAmericanBlackStudentEducation/Documents/Spectrum-of-Family-Community-Engagement-For-Educational-Equity.pdf
- International Association for Public Participation. *IAP2 Spectrum of Public Participation*. 2018. Retrieved from https://cdn.ymaws.com/www.iap2.org/resource/resmgr/pillars/Spectrum_8.5x11_Print.pdf
- WE ACT for Environmental Justice. *Community Engagement Brief*. 2022. Retrieved from https://www.weact.org/wp-content/uploads/2022/10/Community-Engagement-Brief-092322-FINAL.pdf

Community Climate Resilience Planning

Communities across North America are coming together to develop climate resilience plans. Although the task may seem daunting, the good news is that the *U.S. Climate Resilience Toolkit* provides a wide range of resources, tools, and information to help community members assess their vulnerability to climate change, make informed decisions, and take action to build resilience. Developed by the U.S. government, the Toolkit helps individuals, communities, businesses, and governments document climate hazards that could harm the things they care about, decide which situations they most want to avoid, and develop workable solutions to reduce their climate-related risks. The Toolkit is organized around five Steps to Resilience:

1) Understand Exposure
2) Assess Vulnerability and Risks
3) Investigate Options
4) Prioritize and Plan
5) Take Action

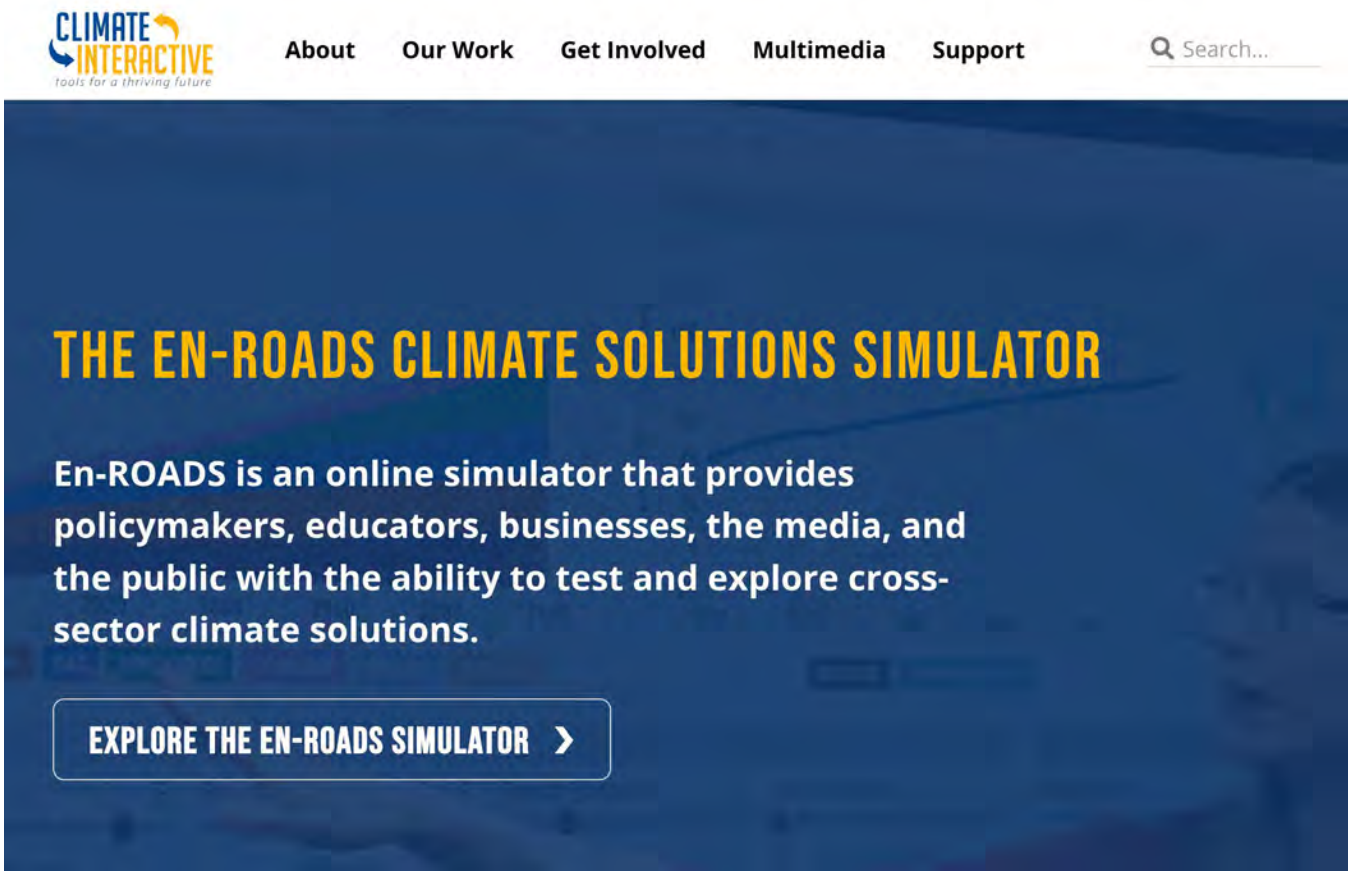
In addition to detailed information about each of the Steps to Resilience, you'll find resources designed to advance equity-centered climate adaptation and resilience planning, including:

- Centering Equity in Climate Resilience Planning and Action: A Practitioner's Guide
- Moving from Faith-based to Tested Adaptation Process and Approach: How Will We Know We're Adapting?
- Incorporating Nature-based Solutions into Community Climate Adaptation Planning

Source: U.S. Climate Resilience Toolkit. *Steps to Resilience*. n.d. Retrieved from https://toolkit.climate.gov/#steps

If you want to learn more about climate resilience planning, there are excellent resources worth exploring:

• Communities Responding to Extreme Weather (CREW). Retrieved from https://www.climatecrew.org/
• Fang, C., J. Hench, C. Daniels, C. and A. Walton. *Centering Equity in Climate Resilience Planning and Action*. U.S. Climate Resilience Toolkit. 2022. Retrieved from https://library.oarcloud.noaa.gov/noaa_documents.lib/OAR/CPO/Climate_Smart_Communities/Vol_03_CSC_CenteringEquity.pdf
• GEOS. *Climate Ready Communities: A Practical Guide to Building Climate Resilience*. 2019. Retrieved from https://geosinstitute.org/initiatives/climate-ready-communities/
• Gonzalez, R. *Community-Driven Climate Resilience Planning: A Framework, Version 2.0*. National Association of Climate Resilience Planners (NACRP). 2017. Retrieved from https://kresge.org/sites/default/files/library/community_drive_resilience_planning_from_movement_strategy_center.pdf
• Grunwald, B., M. Reback, and R. Warsing. *Weathering Climate Disasters with Resilience Hubs*. October 2022. Retrieved from https://rmi.org/weathering-climate-disasters-with-resilience-hubs/
• Tree People. *Community Organizing Around Resilience Guide*. 2022. Retrieved from https://www.treepeople.org/wp-content/uploads/2022/02/community-organizing-around-resilience-guide.pdf
• Urban Sustainability Directors Network (USDN). *Resilience Hubs*. n.d. Retrieved from https://resilience-hub.org/



En-Roads

En-ROADS is a free, transparent, easy-to-use policy simulator for creating pathways to successfully address climate change globally. En-ROADS allows users to design scenarios to limit global warming. The model focuses on how changes in energy, economic, and public policy systems could affect greenhouse gas emissions and climate. Users can explore the impact of dozens of policies, such as electrifying transport and pricing carbon.

Climate Interactive and the MIT Sloan Sustainability Initiative developed En-ROADS, which is commonly used in classrooms ranging from middle school to graduate level students.

For more information about En-ROADS, visit https://www.climateinteractive.org/en-roads/

Interconnected Airshed

Today, a large-scale effort led by the Public Health Institute of Western Massachusetts is taking a regional approach to air quality. The Healthy Air Network coalition considers the problems and the solutions throughout the Connecticut River Valley as an "interconnected airshed." This approach mimics the watershed concept for air quality and engages many partner groups, including housing organizations, city officials, public health groups, environmental groups, youth groups, and more. Furthermore, these regional efforts have started linking with broader statewide efforts to share ideas and coordinate policy advocacy.

This interconnected airshed community collaboration originally stemmed from a regional asthma coalition. The city of Springfield, Massachusetts, had the highest asthma rates among children and people of color. Community, environmental, and civic health groups within Springfield began organizing to address environmental justice issues related to poor air quality and asthma. This commitment led to a robust air quality monitoring network that continues to measure air quality. Members combine indoor and outdoor air quality data to better understand total public exposure.

"A piece of the puzzle involves being willing to think broadly about who is involved, not necessarily to be the leader. Thinking about an airshed-level connection between climate, health, and air quality is atypical. It becomes a question of scale: What is the appropriate scale to think about collaboration and change? Change can result from the recognition that there is a need to operate at that regional scale since that is indeed the scope of the problem," says Billy Spitzer, executive director of the Hitchcock Center for the Environment in Amherst, MA, and member of the Healthy Air Network.

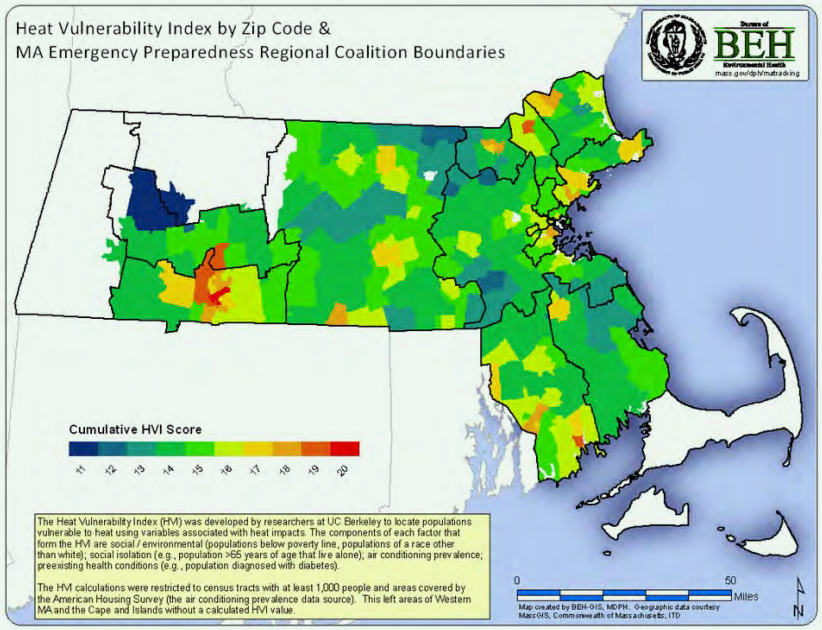
This powerful interconnected airshed coalition now advocates for air quality solutions, as well as regional transportation solutions, renewable energy investment, and fossil fuel reduction across the entire Connecticut River Valley. This work began with the correlation of public health concerns to poor air quality and extreme heat events in poor, rural communities, which are often the first populations affected by a changing climate.

GUIDELINES IN PRACTICE

Interconnected Airshed

Why Healthy Air Network Works:

- The regional, coalition-based approach affords the interconnected airshed partners a pathway to examine the scales at which human systems operate and need to be influenced, as well as how they interact with the climate system.
- The source of most money and power was found to operate at the municipal and state levels. Identifying these leverage points yielded concrete action.
- These interconnected airshed collaborators operate at the intersection of science, activism, and community engagement.



To be most effective, local solutions need to link up at a larger scale to amplify results. Local efforts amplify their effectiveness further when they coordinate and learn from each other. It is important to recognize and understand the scale of action. Interconnected airshed collaborators do not assume that the scale of the problem is local or that it is restricted to the size or reach of a single organization. The need for coalition building across disciplines is profound.

To learn more about the Healthy Air Network:

- Public Health Institute of Western Massachusetts: https://www.publichealthwm.org/
- Hitchcock Center for the Environment: https://www.hitchcockcenter.org/
- Healthy Air Network: https://www.healthyairnetwork.org
- Air Quality Resources, Healthy Air Network: https://healthyairnetwork.org/resources/
- EJScreen: Environmental Justice Screening and Mapping Tool: https://www.epa.gov/ejscreen

Resource #21

Youth-Led Community Impact Projects

Facilitating the development of youth-led community projects and solutionary initiatives is complex work. Luckily, we have two resources that provide some guidance. The San Mateo County Office of Education (California) has created a resource that provides "tips, suggestions, resources, and project ideas to help you start a green team or environmental club." The Green Team Guide provides step-by-step instructions designed to help you and your green team:

- Set your team's goals and objectives.
- Get permission and support from school administrators.
- Recruit team members consisting of students, teachers, parents, and school staff, including custodians, lunch personnel, office administrators, etc.
- Name your team (or it could also be called the Green Team).
- Establish a leader and assign roles and responsibilities to team members.
- Determine the best time of day for your team to meet.
- Create a calendar and set meeting dates.
- Send out invitations and a green team application.
- Determine project ideas for the year, including Earth Day and Earth Month.

The Green Team Guide includes strategies, guiding questions, project ideas, resources, and more.

Source: San Mateo County Office of Education Environmental Literacy and Sustainability Initiative. *Green Team Guide*. n.d. Retrieved from https://www.smcoe.org/assets/files/For%20Families_FIL/Green%20Team%20Guide%20for%20Students_FIL/Green%20Team%20Guide_2.pdf

The second resource, created by Andra Yeghoian, outlines the process of developing a student-led environmental and climate solutionary initiative. According to Yeghoian,

> *An environmental and climate solutionary initiative is a type of impact project (service work done by a person or group of people) that benefits a local community (school, neighborhood, city, etc.). A* ***solutionary*** *is someone who is able to identify inhumane and unsustainable systems, then develop solutions that are healthy for people, animals, and the environment. In an* ***environmental and climate solutionary initiative****, students analyze real-world environmental and climate justice problems and develop solutions in their local community that seek to mitigate these problems through policy change, behavior change, and cultural mindset change. Leading solutionary projects allow youth voices to be heard and incorporated into local policy, provides an opportunity for youth to develop leadership skills and career training, and can make lasting impacts that improve the health and well-being of a community.*

Source: Yeghoian, A. *Student-Led Environmental and Climate Solutionary Initiative Overview*. n.d. Retrieved from https://docs.google.com/document/d/1aWNLrTncf-of49z4hL7LjygXki1mS1DCLfbmFOxgfAg/edit

Here are some additional resources you might find interesting:

- Indiana University, Center on Representative Government, *iEngage*. 2024. Retrieved from https://corg.iu.edu/programs/iengage/index.html
- PBLWorks. *Teaching About Climate Change with Project Based Learning*. n.d. Retrieved from https://www.pblworks.org/teaching-about-climate-change-project-based-learning
- Yeghoian, A. *Change Theories for Environmental and Climate Action Solutionaries*. 2023. Retrieved from https://docs.google.com/document/d/1glegIodrYYJIkgMyqHzyXxnZQEer04sXnm5prCsAfww/edit
- Yeghoian, A. *Overview to Youth-Led Solutionary School Board Policy Advocacy Campaigns for Environmental and Climate Action in California's TK–12 Schools*. 2023. Retrieved from https://docs.google.com/document/d/1c6_vzNqdajDuZAWofdpt0Y-d4UdxL8sc5cJ4qdSPB-s/edit
- Yeghoian, A. *Resource Center for Environmental and Climate Action Changemakers in TK–12 Schools*. n.d. Retrieved from https://sites.google.com/view/scrs-center/home

Environmental Action Civics – A Pathway for Young People to Take Action

The Earth Force Process is a research-based model to implement Environmental Action Civics. In the six-step process, students identify environmental problems, determine the policies and practices at the root of the problem, and then implement solutions using civic means. The process prioritizes youth-adult partnerships, shared-decision-making, and civic action. In Sheridan, Colorado, students have been using these steps to make their community more resilient to climate change.

- **Step 1:** Students in Sheridan began their inventory process by taking a guided tour of their defined community (the school's campus) to identify potential issues. They investigated their track and sports fields and found the space was mainly unused because continual flooding from increasingly common 100-year events has caused serious deterioration and cracking. To gather more information, the students interviewed school staff and resource professionals about the damaged track and sports field. They found other issues around their school, including vandalism, littering, and unsafe walking areas.
- **Step 2:** After these initial environmental inventories, students democratically decided (through voting) to focus on one issue: the deterioration of their track caused by flooding from increased rainfall events.
- **Step 3:** Once the students selected an issue, they collaborated and conducted research, including speaking to different community members to gain a deeper understanding. Students talked with their district administration and city of Sheridan officials. They learned that the track was built in the middle of a drainage area that doesn't carry water away from the site, creating significant flooding and rendering the track unusable. Now that the students understood their issue more deeply, why it was happening, and who was affected and involved, it was time to discuss strategies for action.
- **Step 4:** Students listed their ideas for action, using criteria like how long the action would take and how much it would cost to make a decision together. With little funding, they decided to partner with their floodplain manager to write a grant application and ask the district to address the issue. To strengthen their request to the district, students made a video explaining the issue and asking the district to fix the improper drainage that ruined the track and led to an unusable space for the community.

- **Step 5:** Now that they had chosen their action strategy students organized tasks and made a plan. They designated each task to a group of students, with one group member serving as the representative for check-ins. One group worked in partnership with those writing the grant. One group created the video presentation, and another shared the presentation with the city of Sheridan. In the end, the students' request for change engaged community partners at Mile High Flood District. The Flood District worked with the students to identify funds that could be reassigned to improve the issue. The Flood District is now undertaking the $4-$5 million improvements the students identified.
- **Step 6:** The grand finale of the six-step process is a celebration and recognition of students' work. This is the time for students to reflect on their experiences and celebrate their successes. Even though the improvements are still in progress the group celebrated their actions and ask for change. Reflecting on their entire experience, the students noted how much they liked working closely on community-change projects with adult decision-makers, even if it was sometimes a bit scary and challenging.

About Earth Force:

Earth Force is a national 501(c)3 organization and the home of Environmental Action Civics. Their mission is to engage young people as active citizens who improve the environment and their communities now and in the future. Through Earth Force and its network of partners, young people get hands-on, real-world opportunities to practice civic skills, acquire a deep understanding of the environment, and develop the skills and motivation to become lifelong leaders in addressing community issues. Visit www.earthforce.org to learn more.

Community Action Projects for the Environment (CAPE) – Youth for Pollinators

Community Action Projects for the Environment (CAPE) is a 4-H program for youth 11 to 18 years old. It guides youth clubs through a process of exploring local environmental concerns, establishing partnerships with interest groups, and making a request of a decision-maker that will benefit the community.

In 2023, a 4-H County Council teen leadership group in Sarasota, FL, launched the CAPE process. Their involvement in raising livestock led them to focus on pollinators, aligning their interests and environmental concerns galvanized by Florida's vulnerability to a changing climate. Climate change effects, including increased temperatures and drought, yield decreases in the number of flowers a plant produces and the amount of nectar and pollen in each flower. Masses of insects pollinate Florida's crops, providing an essential benefit to agriculture. However, a changing climate reduces the number of pollinators an area can support. These effects of climate change combine with other drivers of species declines, such as habitat loss, pesticide use, and disease propagation, which are likely to interact to reduce biodiversity. Through the CAPE process, this teen group ultimately became empowered to seek approval to plant a pollinator garden and create supporting videos to teach about the importance of pollinators.

After researching local pollinator issues, the CAPE pollinator proponents engaged local stakeholders. They met with a Florida-friendly landscape specialist to learn about the significance of trees in supporting pollinators and the County Extension director to discuss the pollinator-based educational competencies of county employees. They wrote a persuasive and successful letter to the County Extension Office to secure permission to plant a pollinator garden on its grounds. With financial support made possible by the CAPE program and a local Florida 4-H Community Pride grant, CAPE youth planted a pollinator-friendly gardenscape on county property. The group also developed a corresponding video series to educate the local community.

The CAPE process uncovers the environmental, economic, justice, and social components of a community issue; effectively engages interested groups and individuals; and engages youth in requesting a change that could help resolve a problem. For the pollinator project, increasing temperatures, more severe drought, and habitat loss reduce the number of pollinators in any given area.

GUIDELINES IN PRACTICE

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Why CAPE Works:

- The CAPE process is structured around eight meetings. In addition to activities during the meetings, each meeting includes a mission to help keep the momentum moving forward and to help youth prepare for the next meeting.
- The CAPE process creates opportunities for learners to make a difference and provides a supportive space to practice doing so. Community-level opportunities invite civic engagement with local leaders in business and government. CAPE helps youth conduct an action project in the community **with** community leaders and **for the** community.
- The CAPE program provides leaders with resources, activity ideas, and training to guide youth into civic engagement.

CAPE's program model is online, readily accessible, and available to youth clubs beyond 4-H. In 2023, CAPE was pilot-tested in a dozen locations, with clubs from Idaho to St. Croix. Continued program evaluation and revision improved the intended outcomes of increased local civic literacy and governance skills, individual and collective self-efficacy, and positive youth development. The CAPE program is based on the Earth Force process of environmental action civics.

To learn more about CAPE:

- Community Action Projects for the Environment: https://programs.ifas.ufl.edu/cape/
- CAPE Leader Training and Materials: https://ifas-sfrc-ee.catalog.instructure.com/courses/cape-community-action-projects-for-the-environment
- CAPE Youth Voices Video (3 mins): https://youtu.be/td_cPWcTraE
- 4-H: https://4-h.org/
- Earth Force Resources: https://earthforceresources.org/

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