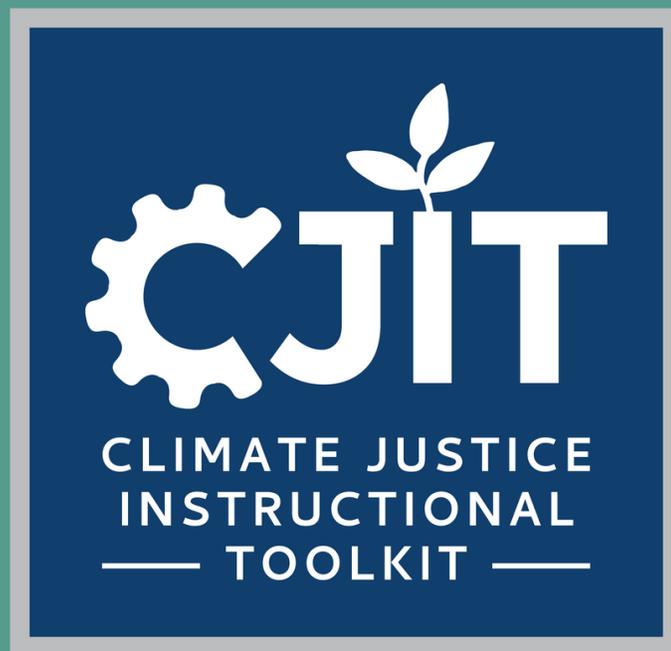


A STARTER GUIDE FOR TEACHING CLIMATE & ENVIRONMENTAL JUSTICE



Research, tools, and tips for teaching
climate justice to undergraduate students
across disciplines



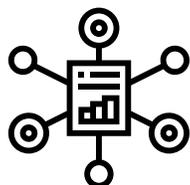
ENVIRONMENTAL
SOLUTIONS
INITIATIVE

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PRINCIPLES FOR TEACHING CLIMATE JUSTICE

USE CLIMATE JUSTICE AS A FRAMEWORK FOR STEM LEARNING



Research has shown that environmental justice content knowledge is less likely to be included in STEM areas (Coleman & Gould, 2019; Garibay et al., 2016). However, **climate justice and civic engagement can provide a foundational framework for a real-world, culturally relevant context to advance disciplinary learning objectives, especially in STEM areas** (Docette et al., 2023). With a student population that is more diverse than ever, and more aware of climate change and social injustice, climate justice issues can provide a meaningful way to teach and learn more abstract skills common in STEM disciplines. For example, Doucette et al (2023) provide examples of climate justice content that can be integrated into STEM courses such as air pollution from coal power in Ulaanbaatar, Mongolia (Remmington Doucette, 2022) for general chemistry, ocean acidification and youth activism for biology, climate life expectancies of women and girls in Mathematics, and carbon emissions and transportation justice for physics. Docette et al.,'s (2023) review of their climate justice across the curriculum work is part of a growing body of research that seeks to integrate climate and environmental justice across STEM areas.

ENGAGE IN LONG-TERM, RECIPROCALLY BENEFICIAL COMMUNITY PARTNERSHIPS



Community engaged teaching and civic engagement are perhaps the most common strategies used in environmental justice teaching (Cachelin & Nicolosi, 2021; Doucette et al., 2023; Garibay & Vincent, 2018; Morales-Doyle, 2017; Kaza, 2002; Rabe, 2022; Rabe, 2023). This is because environmental justice practitioners and instructors understand that **justice is a verb that requires action and engagement with communities most impacted by climate justice issues**. However, community engaged teaching requires long-term commitment and reciprocally benefiting relationships between the educational institution and community partners (Mitchell, 2008; Quan, 2023). To start, think about developing a strong relationship with a partner based on shared interests through deep listening and the development of long-term mutual goals before jumping into a co-teaching project. It is crucial that the organization or community members are receiving equitable benefits from the project and that the teaching and learning process contributes to addressing issues within the climate justice movement in some way.

PRINCIPLES FOR TEACHING CLIMATE JUSTICE

CENTER DIVERSE VOICES FROM THE CLIMATE JUSTICE MOVEMENT



Because environmental and climate justice focus on how the world's most vulnerable groups have been disproportionately impacted by climate change and environmental burdens (Mohai et al., 2009; Sultana 2022), **including activist and community voices** working on the front lines is a crucial component to climate justice instruction and learning. This fosters opportunities for an intersectional approach (Maina-Okori et al., 2018) to understand climate justice where various social groups and groups facing intersecting and compounding oppressions can share their experiences, context-specific tools, frameworks, and solutions they have implemented to address issues in their communities. A foundational resource for this practice is the book and website: *All We Can Save* (Johnson & Wilkison, 2020) which includes writing from women and women of color activists and thinkers from different spaces within the climate justice movement. In addition, The Environmental and Climate Justice Syllabus was recently launched out of the Just Environments Lab from UC Berkeley. Their goal for this project reaffirms that those involved in the climate justice movement on the frontlines should be a central voice in the teaching and learning process: "Our emphasis, here, is to generate a searchable and citable list of Black, Indigenous, and/or Latinx individuals, organizations, and movements which are indispensably foundational in the continued fight for environmental and climate justice."

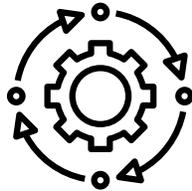
CENTER STUDENT VOICES AND EXPERIENCES



Similar to including voices, knowledge and experiences from environmental justice communities, it is vital to create space and opportunities for **students to share their perspectives** on climate justice issues close to them. This may be climate justice issues that students have been involved in, or issues that they or their families have experienced around the world. Students' lived experiences represent an incredible fund of knowledge from which instructors can tap into to create a more culturally relevant and anti-racist learning environment for the classroom (Ladson-Billings, 1995; Paris-Alum, 2013). LaChance et al. (2023) provide an example of how students with climate activist experiences and interests can form cogenerative dialogues with instructors to co-create the curriculum and instructional approach, even in a STEM focused course such as chemical engineering.

PRINCIPLES FOR TEACHING CLIMATE JUSTICE

CRITICALLY EXAMINE THE INTERSECTIONS OF SOCIAL JUSTICE, ENVIRONMENTAL, AND CLIMATE SYSTEMS



Systems theory is often noted as a foundational aspect of environmental and sustainability education due to its interdisciplinary nature and integration of socio-political, socioeconomic and socio-environmental systems. Different from a mainstream environmental education approach, a crucial aspect of teaching climate/environmental justice is to **recognize and emphasize how unjust social systems** such as racism, sexism, classism, and the many other oppressive forces interconnect with environmental and climate issues. A critical aspect of this is to **examine the inequitable ways power is enforced** and distributed across different spaces and contexts. Examples of this issues include deforestation and its devastating impact on eliminating carbon sinks and Indigenous land, culture and knowledge, or the mining for minerals involved in the transition to renewable economy, and the impact on communities near mines across the global south. With these two examples in mind, instructors should consider focusing more on how social inequities (that result from power) cannot be disentangled from environmental degradation, and explore how solutions to climate change should be grounded in addressing social issues at their origins. This is also referred to as focusing on the **root causes** of climate justice.

ANALYZE MULTIPLE CONCEPTUALIZATIONS OF JUSTICE



Conceptualizations of justice within social and environmental movements are sometimes under examined, and in some cases, practitioners or instructors only reference distributional or representational forms of justice. Although distributional justice is a critical step in understanding environmental justice (EJ) issues, it is also important to more **carefully examine other forms of justice** in conjunction with climate related problems. These include participatory, recognition-based (Schlosberg, 2013), epistemic (Temper & Bernal, 2016) and restorative justice (Robinson & Carlson, 2021) should be explored in any climate or environmental justice course. When working with students on a particular EJ issue in conjunction with your course material, make sure to focus on what kind of justice is at play.

PRINCIPLES FOR TEACHING CLIMATE JUSTICE

FOCUS ON SOLUTIONS, INVOLVEMENT, AND ACTION AT DIFFERENT SOCIETAL LEVELS



When adding climate justice content to a course, it is paramount to focus heavily on the details to understand the **root causes** of a particular problem. However, only focusing on the problem can leave students in a state of frustration, discontent, and even despair. **Integrating specific lessons, activities, resources, or projects that provide students with opportunities to get involved** with a local (or global) issue at the individual, community, or political level is an important process of instilling agency and motivation in students related to their ability to participate in societal change. A recent research study on an EJ class at the University of Michigan showed that student self-efficacy for climate action was most salient when students were confident in a certain skill, and when the size and scale of the problem matched their ability (Bartlett et al., 2022). This research shows that instructors should attempt to match the scale of a particular climate justice problem with the skills and learning objectives within their course, and possibly emphasize to students how this skill is practical and applicable to a specific issue. For more activities and ideas about involving students in action, see the All We Can Save website's section on tools for educators, and also view the Climate Justice Instructional Toolkit modules which all feature versions of activities for involvement.

INCLUDE ALTERNATIVE WAYS OF KNOWING



Climate justice instructors and practitioners understand that Western/Eurocentric, academic knowledge is not sufficient to fully address the climate crisis. What is more, knowledge from the climate justice movement such as knowledge from BIPOC communities, and Traditional Ecological Knowledge (TEK), or knowledge grounded in spirituality and contemplative practice is more often than not excluded or devalored within classrooms both in high education and K-12. As such, a foundational aspect of climate justice teaching should **include a constructive critique of expert-based, Eurocentric knowledge and an exploration of alternative ways of knowing related to climate and environment** (Rabe, 2023). Alternative ways of knowing and knowledge production might include aspects of spirituality such as mindfulness meditation and climate justice (Raine, 2022), psychological tools to deal with climate distress or eco-anxiety (Jaquette-Ray, 2020; Pikhala, 2020), and TEK or Decolonial Knowledge (Newbury and Trujillo, 2020). To explore some ways to address the intersection between climate justice and psychological issues, a recent tool to explore some of these alternative ways of knowing is called the [Existential Toolkit for Climate Justice](#). In addition, please see our module on Climate Justice and Emotions.

TEACHING TOOLS AND TIPS

HOW TO USE THE CLIMATE JUSTICE INSTRUCTIONAL TOOLKIT

- **Explore this starter guide** for teaching climate justice to learn about teaching principles, view teaching tools, and explore a collection of research articles for teaching climate justice across disciplines. This is especially important in the area of integrating community engagement or inclusive and anti-racist practices into the instructional process, as these approaches require longer-term experimentation and commitments.
- **Find resources and generate ideas** for teaching climate justice, regardless of the disciplinary context. As researchers illustrate that climate justice can be used as a foundational framework that can provide real-world, socially just, and inclusive context to infuse into scientific learning. From this angle, it also could provide an important way to create a more inclusive classroom climate.
- **Mix, match, and redesign** slides, activities, or resources from the differing modules to build your own personalized slide deck that matches your teaching context.
- **Flip the classroom:** assign a module to your students to have them review a particular climate or environmental justice topic outside of class. Then, use class time to relate it to foundational disciplinary course content.
- Provide students with an opportunity to **self study**, or for graduate students and postdocs to run smaller courses during winter and summer sessions.

Contribute to the Toolkit: contact Chris Rabe at ESI (cjrabe@mit.edu) to add your own module, resource, or other addition to the Toolkit.

OTHER EDUCATIONAL AIDS AND TOOLKITS

[Discipline-Specific Climate Justice Teaching Ideas](#) (Doucette et al. 2023)

[Justice-Centered Climate Change Teaching and Learning](#) (Bell and Rhinehart 2021)

[The Climate Justice Existential Toolkit](#)

[EJ and TECH Blueprint from Earth Hacks](#)

[The All We Can Save Project](#)

[Teaching Environmental Justice](#)

[Climate Justice in Your Classroom E-book](#)

[Environmental and Climate Justice Syllabus](#)

[UC Center for Climate Justice](#)

[MIT Climate Portal Explainers and Podcast](#)



"Protester holding a sign with 'Climate Justice Now' message at a Global Climate Strike (51058381908)" by Ivan Radic is licensed under CC BY 2.0.

RESEARCH ON CLIMATE JUSTICE EDUCATION

CONTENT INCLUSION

Racially inclusive climates within degree programs and increasing student of color enrollment: An examination of environmental/sustainability programs (Garibay and Vincent 2016)

Inclusive Sustainability: Environmental Justice in Higher Education (Lu et al. 2017)

Program and institutional predictors of environmental justice inclusion in U.S. post-secondary environmental and sustainability curricula (Garibay et al. 2015)

Exploring just sustainability across the disciplines at one university (Coleman and Gould 2019)

Cultural Competence in the College Biology Classroom (Tanner and Allen 2017)

STUDENT PERCEPTIONS & EXPERIENCES

Students of colour views on racial equity in environmental sustainability (Schusler et al. 2021)

Racial and ethnic differences in the students' readiness, identity, perceptions of institutional diversity, and desire to join the environmental workforce (Taylor, 2018)



FACULTY DIVERSITY

Diversity content in STEM? How faculty values translate into curricular inclusion unevenly for different subjects in environmental and sustainability programs (Garibay et al., 2020)

Faculty diversity in California environmental studies departments: implications for student learning (Taylor, et al., 2022)

GENERAL

Higher Education's Role in Advancing Climate Justice (Second Nature, 2022)

Inclusive Sustainability: Environmental Justice in Higher Education (Lu et al. 2017).

Educating for Environmental Justice (Haluza-Delay, 2013)

Doing environmental justice: Prospects for sustainable engagement—From classroom to fieldwork (Butt, 2022)



"Wildfire" by NPS Climate Change Response is marked with Public Domain Mark 1.0.

RESEARCH ON CLIMATE JUSTICE IN STEM



"Southern Ocean Iceberg" by D-Stanley is licensed under CC BY 2.0.

TECHNOLOGY

[Technology for Climate Justice: A Reporting Framework for Loss and Damage as Part of Key Global Agreements](#) (Homberg and McQuistan 2018)

[Computing Research for the Climate Crisis](#) (Bliss et al. 2021)

[Using A Digital Justice Framework To Improve Disaster Preparation And Response](#) (Sanders 2023)

[AI for climate: freedom, justice, and other ethical and political challenges](#) (Coeckelbergh 2020)

[The carbon impact of artificial intelligence](#) (Dhar 2020)

ENGINEERING

[The Climate is Changing. Engineering Education Needs to Change as Well](#) (Martin et al. 2022)

[Teaching Environmental Justice Principles to Chemical Engineering Seniors: An Antiracist, Collaborative Approach](#) (LaChance et al. 2021)

[Engineering for the People: Putting Peace, Social Justice, and Environmental Protection at the Heart of All Engineering](#) (Karwat 2019)

[Environmental Engineering for the 21st Century: Increasing Diversity and Community Participation to Achieve Environmental and Social Justice](#) (Montoya et al. 2021)

SCIENCES/STEM

[Teaching STEM Through Climate Justice and Civic Engagement](#) (Doucette et al. 2023)

[Situating the Scientist: Creating Inclusive Science Communication Through Equity Framing and Environmental Justice](#) (Polk and Diver 2020)

[From Empowerment to Response-Ability: Rethinking Socio-Spatial, Environmental Justice, and Nature-Culture Binaries in the Context of STEM Education](#) (Kayumova et al. 2018)

CHEMISTRY

[Social and Environmental Justice in the Chemistry Classroom](#) (Lasker et al. 2017)

[Teaching Sustainability and Environmental Justice in Undergraduate Chemistry Courses](#) (Aoki et al. 2022)

[Green Chemistry as Just Chemistry](#) (Lane et al. 2023)

MATH

[Humanizing Mathematics: Modeling for Climate Justice](#) (Alsup 2021)

[Application of Mathematics to Explore Social and Environmental Justice Issues](#) (Chambers 2022)

[Linking Differential Equations to Social Justice and Environmental Concerns](#) (Dunmyre 2019)

PHYSICS

[Redefining Energy Justice in Physics Classrooms](#) (Hernandez et al. 2022)

[Toward an Effective Pedagogy of Climate Change: Lessons From a Physics Classroom](#) (Singh 2020)

CLIMATE JUSTICE IN OTHER DISCIPLINES

HISTORY

[Teaching Themes in World History: Climatic and environmental change](#) (Gooding 2021)

[Teacher's Guide to Environmental Humanities: History, Justice, and Education](#) (Baer)

[Spotlight On: Indigenous Leadership in the US Environmental and Climate Justice Movements](#) (Martin et al. 2020)

POLITICAL SCIENCE

[Environmental Justice from a Political Science Perspective](#) (Puaschunder 2019)

[A Sea of Riches: Teaching an Interdisciplinary Environmental Justice Course through Political Theory, On-Campus and Online](#) (Gabrielson and Watts 2014)

[A model for teaching environmental justice in a planning curriculum](#) (Washington and Strong 1996)

BUSINESS/ECONOMICS

[A Framework for Business Action on Climate Justice](#) (Rahman et al. 2022)

[Between science and activism: learning and teaching ecological economics with environmental justice organisations](#) (Martinez-Alier et al. 2011)

[Teaching environmental justice with data-driven projects](#) (Henderson 2022)

WRITING/LITERATURE

[Transdisciplinary Rhetorical Work in Technical Writing and Composition: Environmental Justice Issues in California](#) (Enriquez-Loya and León 2020)

[Situating the Scientist: Creating Inclusive Science Communication Through Equity Framing and Environmental Justice](#) (Polk and Diver 2020)

LAW

[Environmental Justice and the Teaching of Environmental Law](#) (Lazarus 1993)

[Environmental Justice in the Classroom: Real Life Lessons for Law Students](#) (Cole 1993)

[Environmental Justice: Legal Theory and Practice](#) (Hill 2009)

[The Exclusion of Environmental Justice and Race in Environmental Law Casebooks](#) (Bidad 2023)

[Teaching Climate Law: Trends, Methods and Outlook](#) (Mehling et al. 2020)



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RESEARCH ON COMMUNITY ENGAGED TEACHING, ACTION AND MENTAL HEALTH

Involving communities in the decision-making process and inclusive climate action

COMMUNITY ENGAGEMENT

[Enacting Environmental Justice Through the Undergraduate Classroom: The Transformative Potential of Community Engaged Partnerships](#) (D'Arcangelis and Sarathy 2015)

[Investigating Critical and Community Engaged Pedagogies for Transformative Environmental Justice Education](#) (Cachelin and Nicolosi 2022)

[Toward "Resistance and Re-visioning": Exploring the Integration of Community Partnerships and Decolonial Field Methods in an Undergraduate Environmental Justice Program](#) (Rabe 2023)

[Intersectional climate justice](#) (Amorim-Maia 2022)



"The classic view over Greenwich Park now savaged by weeks of extreme heat and drought." by alisdare1 is licensed under CC-BY-SA 2.0.

TEACH FOR ACTION

[How to Find Your Joy in Climate Action](#) (Johnson 2022)

[An environmental justice framework for exposure science research](#) (Van Horne et al. 2023)

[National and Regional Organizations](#)

MENTAL HEALTH

[Climate Anxiety](#) (Schmidt 2023)

[Climate-Aware Therapist Directory](#)

[Climate Awakening](#)

[The Work That Reconnects](#)



"Flooded City Dock in Annapolis, MD King Tide" by Forsaken Fotos is licensed under CC BY 2.0.