

Environmental Education: An Active Pedagogy to Integrate Environmentalism, Engagement, and Equity

By Olivia Whitmarsh, Geneseo Class of 2021
 Capstone Advisor: Dr. Robert Feissner

Abstract: The environmental and climate changes occurring on our planet are largely the result of human actions. In concert, rampant bias and inequity exist in many human spheres, including – but not limited to – social, academic, and civic. Environmental education (EE) is a methodology and mindset that integrates systems thinking, hands-on learning, and social justice work across a cohesive curriculum. EE empowers educators, learners, and community members in many ways. Whether it is taking an active role in learning, protecting and restoring the environment, or dismantling biases, EE provides tools for success. I provide five lesson plans that serve as a basis for the development of a science curriculum based in EE principles at the 7-12 level. These lessons may be personalized in a number of ways to suit a variety of learners and learning needs. Ideas to help educators meet students’ needs and gradually reduce dependence on teacher-centric learning, is provided throughout. This allows scaffolding of the curriculum for a variety of levels. I provide pedagogical and EE principles to accompany each lesson and detail the process of development of this curriculum.



Ecological Footprint Calculator: This online tool from the Global Footprint Network allows students to reflect on the impacts of their families and communities on global systems of climate, infrastructure, and environmental change. This resource is a powerful tool for introducing the highly-interconnected aspects of sustainability, and its many branches. Users can examine how their transportation, diet, housing, and other aspects of daily life impact the global environment and are also invited to explore solutions to help offset these impacts.

What does environmental education look like in the classroom?

The Fish Game: This interactive sustainability game provides students with an easily-accessible example of sustainability in action. Gameplay is simple and requires very little introduction. Taking into consideration the desire to make money as a fisherperson, keep all the fisher folk happy, and maintain the population of fish in the lake, students are introduced to the many aspects of sustainability, and can begin to consider sustainability an umbrella term that extends beyond the environmental.

A Short History of Nearly Everything: Bryson’s witty and engaging novel provides a huge wealth of knowledge in bite-sized chapters and accessible language. In just a few pages, Bryson details the contributions of Thomas Midgley, Jr., an inventor who added lead to gasoline and dabbled in refrigeration, at the cost of the environment. The political, economic, and social implications of Midgley’s actions make this chapter an excellent example of the multipronged approach that sustainability action must take.

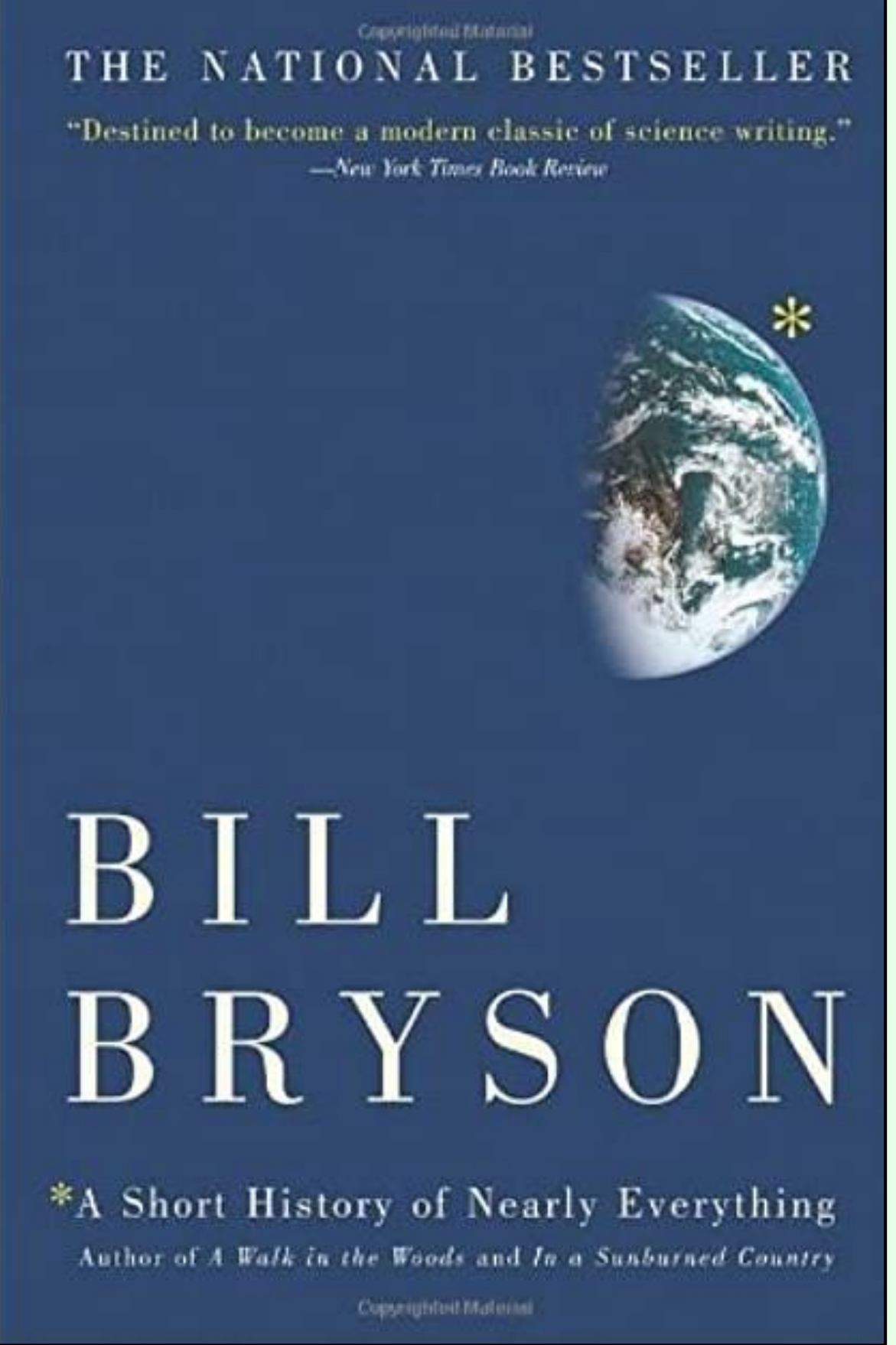


Image courtesy of Goodreads.com



Image courtesy of cloudinstitute.org/fish-game

Acknowledgements: I would like to thank Dr. Feissner of the Biology Department, and Drs. Carly Herold and Lisa Meyer of the Edgar Fellows Honors Program, for their supervision and support throughout this project. I would also like to thank my friends, family, and colleagues for their enthusiasm, understanding, and invaluable help throughout my capstone experience, especially Colin McClure and Cat Steele.

References:

Bryson, B. (2004). *A short history of nearly everything*. Broadway Books.

Carmasso, M. J., & Jagannathan, R. (2018). Nurture thru Nature: Creating natural science identities in populations of disadvantaged children through community education partnership. *Journal of Environmental Education*, 49(1), 30-42. <https://doi.org/10.1080/00958964.2017.1357524>

Cloud Institute. (n.d.). *Play the fish game*. Cloud Institute for Sustainability Education. Retrieved April 16, 2021, from <https://cloudinstitute.org/fish-game>

Evans, N. (. Stevenson, R. B., Lasen, M., Ferriera, J.-A., & Davis, J. (2017). Approaches to embedding sustainability in teacher education: A synthesis of the literature. *Teaching and Teacher Education*, 63, 405-417. <https://doi.org/10.1016/j.tate.2017.01.013>

Global Footprint Network. (n.d.). *What is your ecological footprint?* Retrieved April 17, 2021, from <https://www.footprintcalculator.org/>

Lowenstein, E., Martusewicz, R., & Voelker, L. (2010). Developing teacher's capacity for ecojustice education and community-based learning. *Teacher Education Quarterly*, 37(4).

Maina-Okori, N. M., Koushik, J. R., & Wilson, A. (2018). Reimagining intersectionality in environmental and sustainability education: A critical literature review. *The Journal of Environmental Education*, 49(4), 286-296. <https://doi.org/10.1080/00958964.2017.1364215>

McClaren, M. (2019). Revisioning environmental literacy in the context of a global information and communications ecosphere. *The Journal of Environmental Education*, 50(4-6), 416-435. <https://doi.org/10.1080/00958964.2019.1687408>

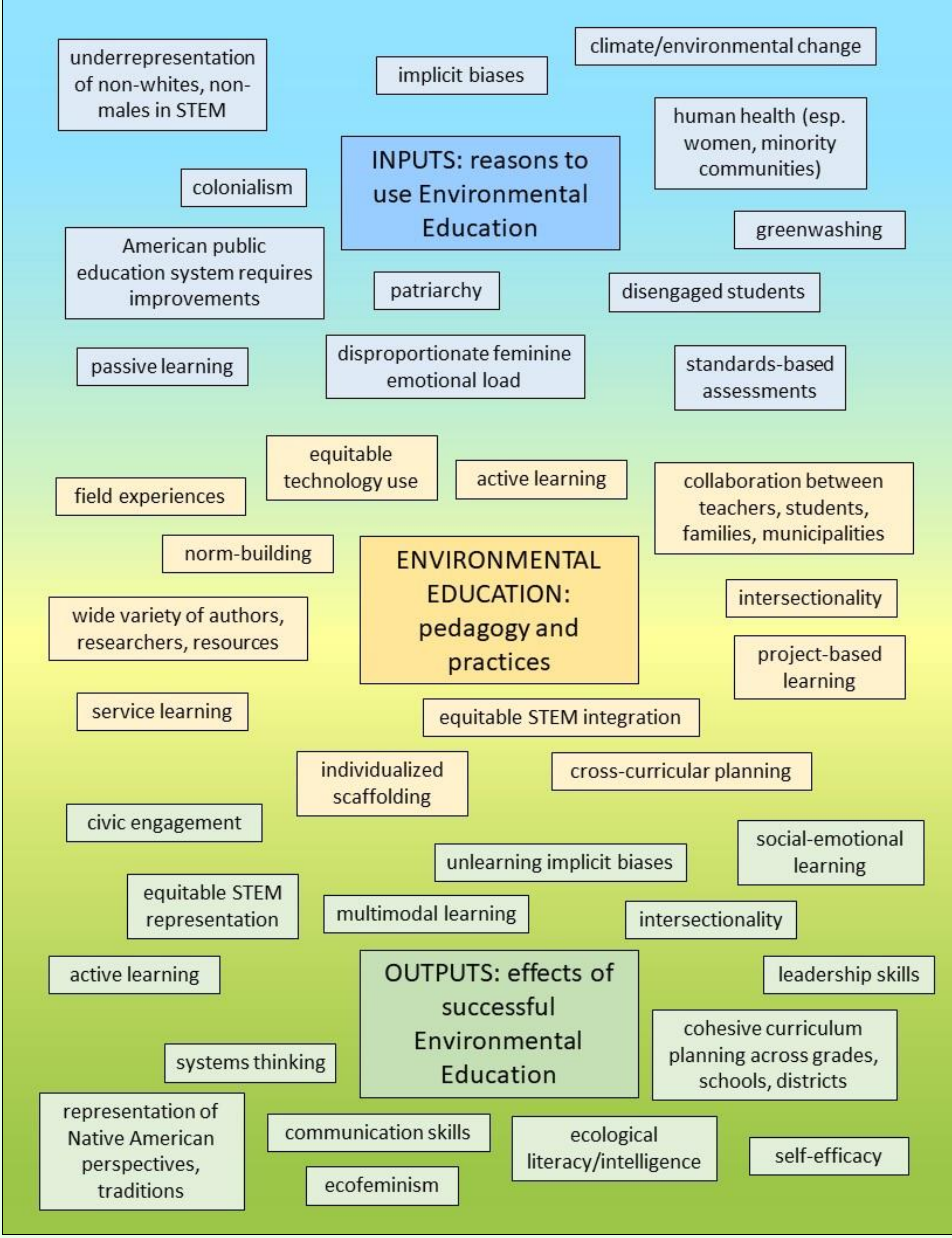
Mitten, D., Gray, T., Allen-Craig, S., Loeffler, T., & Carpenter, C. (2018). The invisibility cloak: Women's contributions to outdoor and environmental education. *Journal of Environmental Education*, 49(4), 318-327. <https://doi.org/10.1080/00958964.2017.1366890>

Nelson, T. (2010). Introduction: Education and the environment. *Teacher Education Quarterly*, 37(4), 3-7.

Stone, M. K. (2010). A schooling for sustainability framework. *Teacher Education Quarterly*, 37(4), 33-46.

Tarrant, S. P., & Thiele, L. P. (2016). Practice makes pedagogy - John Dewey and skills-based sustainability education. *International Journal of Sustainability in Higher Education*, 17(1), 54-67. <http://proxy.geneseo.edu:2108/10.1108/IJSHE-09-2014-0127>

Inputs, Components, and Outputs Environmental education can take on several forms, to address a wide variety of issues, and produces an equally wide variety of outcomes. Featured here are some of the most notable, important, and well-studied reasons to implement environmental education, the ways it manifests in the classroom, and outcomes for students of environmental education.



Next Steps: COVID-19 interrupted plans to implement these lessons in a classroom setting. As educational institutions return to a more normal schedule, I plan to implement these lessons in the classroom. My graduate work will also center on these topics, and my lesson planning here will be valuable in my entrance to graduate study as a foundational work. Finally, the lessons, activities, and resources I have created will be licensed under Creative Commons and listed on Teachers Pay Teachers, a website for educators to share resources, so that a variety of educators can make use of them.