Ecology, Justice, and Student Voice:
Understanding Living Systems and How We Can Protect the Earth

Developed by Eric Frias, Rowland High School
Specialized Academic Instruction & Biology

Welcome! My name is Eric Frias, and this unit was developed to engage high school students—especially those in Special Education and multilingual classrooms—with the life sciences through the lens of ecological systems, environmental justice, and student empowerment.

Rooted in the compelling world of *The Last Wild* by Piers Torday, this 7-week unit brings together NGSS-aligned biology concepts, including energy flow, nutrient cycles, population dynamics, and ecological relationships, with real-world activism and equity-based learning. Students don't just study nature, they explore their own connections to land, culture, community, and climate.

This curriculum was designed with diverse learners at the center. Many of my students have IEPs, are English Learners, or come from underrepresented communities with deep cultural knowledge and lived experiences of environmental harm. I believe that science should help them understand their world and change it. Lessons include:

- Hands-on, visual learning experiences
- Accessible assessments with options for expression (writing, drawing, speaking)
- Authentic texts from *The Last Wild* to real news on issues like the Flint Water Crisis
- Structured supports for SPED and EL students
- Opportunities to take action through personal storytelling and advocacy

Throughout the unit, students ask essential questions:

- *How are we connected to nature?*
- *Why do some communities suffer more from environmental harm?*
- *What can young people do to protect the Earth and each other?*

By the end of the 7 weeks, students will have created a culminating project with a justice-centered science campaign that allows them to speak as scientists, storytellers, and change-makers.

Thank you for exploring this curriculum. I hope it serves as both a toolkit and a testimony: that when we teach science through justice, we help our students become not just observers of the world, but architects of its healing.

Caring for Our Planet: Ecology for Everyone

Eric Frias, Rowland High School

Grade level & subject area: SAI - Science/Biology (9th–12th Grade)

State Standards Alignment:

1. HS-LS2-1: Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems.
2. HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations.
3. HS-LS2-6: Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms.
4. HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
5. Integration with ELA/Literacy: RST.9-10.1, WHST.9-10.2, SL.9-10.4
6. CA ELD Standards: Part I: Interacting in Meaningful Ways (collaborative, interpretive, productive); Part II: Learning About How English Works (structuring cohesive texts)

Connections to Dimensions of Teaching for Social Justice (Dover, 2015):

1. **Curricular:** Includes topics like pollution and how it affects people differently.
2. **Pedagogical:** Uses UDL (Universal Design for Learning), multiple ways to show understanding, and student choice.
3. **Social Action:** Students create simple action projects, like posters to reduce littering or sharing tips on saving water. Be a advocate for change.

Essential Questions*:*

1. What do living things need to survive?
2. How are plants, animals, and people connected?
3. What happens when people harm the environment?
4. What can we do to help the Earth?

Learning Objectives: *Students will be able to…*

- *Analyze ecosystem interactions and energy flow using food webs and trophic levels.*
- *Use population data to model ecosystem dynamics.*
- *Investigate local environmental issues and propose science-based solutions.*
- *Explain how human activities affect biodiversity.*
- *Communicate scientific findings through multimedia presentations and persuasive writing.*

Key Assessments: *What are the important formative and summative assessments associated with this lesson? How do they reflect the overarching social justice vision for this lesson or unit?*

Formative:

- Picture sorts (living vs. nonliving, animal roles)
- Sentence frame writing: "Trees are important because…"
- Oral check-ins with visuals or yes/no boards
- Interactive notebook reflections
- Data analysis on population graphs
- Peer discussions on environmental case studies

Summative:

- Nature Walk Poster: Students observe an outdoor area and draw or paste pictures of things they see (with labels or sentences).
- "I Can Help the Earth" project: Students create a brochure, video, or presentation using simplified templates to show how they can care for the Earth.

Lesson Steps or Instructional Activities: *Include hyperlinks to google slides, instructional resources, handouts, etc.*
Lesson Plan for Teacher
Ecology Daily Agenda

Additional Resources:

- The Last Wild Questions
- Flint water Crisis Reading
- UN Declaration on access to a healthy environment.
- Parable of the Sower – Literature / History / Human Rights