

BEST PRACTICES OF EDUCATION FOR SUSTAINABILITY

Schools participating in the CELF Leadership Training in Sustainability Curriculum and Assessment project are committed to making explicit curricular connections to sustainability in order to strengthen students' enduring understandings of environmental stewardship. These schools believe Education for Sustainability (EFS) can be an effective lens through which academic skill instruction can be delivered and Earth Citizenship can be developed.

CELF promotes best practices for Education for Sustainability through the research-based curriculum of its project partners, national environmental literacy and EFS standards, and local community-based partnership opportunities. These best practices provide students with opportunities to develop as Earth Citizens who:

- Act as stakeholders in civic and environmental issues;
- Are motivated to participate in STEM curriculum since it provides them with skills to create a sustainable future;
- Develop the stewardship attributes and values needed to protect the Earth's resources; and
- Practice critical systems-thinking skills by examining the interdependence of elements within systems, and recognize causal and feedback loops.

In addition to supporting teachers with EFS lesson plan exemplars and specifically requested samples of EFS unit studies, CELF supports teachers' view of EFS as a framework for interdisciplinary learning, incorporating Common Core Learning Standards, and Next Generation Science Standards in their EFS work with students. CELF's work with project schools goes way beyond singular environmental literacy events that are often disconnected from the ongoing dynamics of the school community while falling short of enduring behavioral changes. Rather, teachers utilize best EFS practices based on authentic comprehensive curricular and school-wide rationales for students to become Earth Citizens and "upstream" thinkers. EFS best practices are referenced throughout the following school project reports. Here is a brief description of some of the approaches and frameworks used thus far, in the project.

Place-Based Learning - Shelburne Farms' Sustainable Schools Project (SSP) a CELF Project Partner

To leverage an already-proven sustainability curriculum platform and to strengthen its application in the large, diverse urban setting of NYC, several visits were scheduled to include Shelburne Farms' Director of Professional Development, Jen Cirillo as a participant. Ms. Cirillo's experience and insights were instrumental in providing team members with strategies to support their integration of EFS Big Ideas into the school's curriculum. Ms. Cirillo personally delivered their *Healthy Neighborhoods/Healthy Kids* curriculum (an SSP developed program) to introduce place-based EFS opportunities to the teams, who also received Shelburne Farms' *Education for Sustainability Starter Kit* and their *Guide to Education for Sustainability*.

The Shelburne Farms' twelve *Big Ideas of Sustainability* provide a framework to connect environmental literacy to issues of equity. They are: Community, Systems, Diversity, Interdependence, Cycles, Change over Time, Limits, Fairness/Equity, Place, Ability to Make a Difference, Long-term Effects, and Equilibrium. This research-based EFS curriculum model begins student-directed learning by connecting students to "place." In place-based learning, students originate driving questions as a means to understanding "place", so learning begins with relevant student inquiry. As a result, academic skills are taught that support authentic student inquiry. One important outcome of this process is that as students become civically engaged as stakeholders, environmental literacy is authentically developed because they care. Students discover sustainability where social, environmental, and economic equity are accessed by all individuals in a community.



ENVIRONMENTAL LITERACY

CEL Leadership Training in Sustainability Curriculum

A Clinton Global Initiative Commitment to Action

National Standards for Education for Sustainability

- United States Partnership for Education for Sustainable Development (USPESD) <http://www.uspartnership.org>
- North American Association For Environmental Education <http://www.naaee.net>

Systems Thinking/Modeling

Systems thinking develops the ability to find the nature of interdependencies within a system. When Using this tool in their EfS work, students are challenged to answer questions such as: What happens when one element of a system changes? How do the parts influence each other? If you take an element out of a system, what is the potential for positive or unforeseen negative consequences? For example, when students use situation-based group games or children’s literature as a context to look beyond linear storytelling, they develop a deeper understanding of complex relationships and events within a story. Causal loops, feedback loops, and patterns are revealed and consequently the student begins to search for these mechanisms in future work. Some examples of these patterns, also known as “Systems Archetypes” include:

- Fixes that Fail: quick and easy solutions often make a situation worse;
- Limits to Success: time horizons and delays result in actuated limits (e.g., a flooded market);
- Tragedy of the Commons: cumulative effect of individual actions (e.g., pollution, littering);
- Shifting the Burden: taking action to treat the symptom without solving the initial problem (e.g., borrowing more money to cover overspending); and
- Escalation: reinforcing loop based on two elements’ mutually increasing actions.

Students who practice looking for and identifying relationships and systems patterns develop critical “upstream” thinking skills, resulting in improved decision-making abilities and a stronger student understanding of social, environmental and economic sustainability.

“Earth Citizen” Character Development Attributes

What attributes and values should Earth Citizens demonstrate to create an ecologically sustainable and equitable society? In what arenas will Earth Citizens need to act? What practices will Earth Citizens need to develop? What dimensions of knowledge will Earth Citizens investigate and apply? CELF’s conceptual framework, adapted from the New South Wales Department of Education and Training, organizes the personal attributes, behaviors, practices, and knowledge that our educational experiences seek to shape through EfS to develop these Earth Citizenship characteristics in students.

http://www.curriculumsupport.education.nsw.gov.au/env_ed/assets/pdf/earth_citizen.pdf

Building community

CEL applies the community-building principles of EfS in every aspect of the project, creating a learning community among project team members, CELF professional developers, and when opportunities arise, with related outside agencies. Reinforcing this approach allows teachers to experience the benefits of a learning community, recognizing personal responsibility, growth in character attributes and shared outcomes to celebrate. It is hoped that comfortable experiences with community-building will inspire teachers to transfer these opportunities to their students.