



Ecological Design: Professional development, curriculum, and support packages for K12 schools and universities



Our world is filled with “stuff”, but where does it all come from, and where does it go when it’s done? How—and why—do we design, create, use and dispose of the things we use each day? This program explores ways to make design, building, and manufacturing greener and more equitable. Programs explore how scientific, economic and cultural factors influence decisions, and the implications for workers, consumers and business leaders.

Creative Change supports K12 schools and universities to redesign curriculum and instruction through a lens of sustainability. Our leveled programs provide a gradual process to help you transition to new ways of teaching and learning. Each level offers customized packages of professional development, curriculum licensing, and strategic planning. Select from four levels based on your organization’s goals and readiness.

Level I) Imagine the Change: 1-3 day introductory programs

Level I ecological design programs introduce new ways of reframing content and instruction through a lens of ecological design, materials science, and product life cycles. Participants envision and define possibilities for change as they experience approaches they can replicate in their own classes. A typical package includes:

- 1-2 days of on-site professional development introducing core ecological design themes
- Age-specific ecological design curriculum samples
- Assessment of faculty interest and needs
- Compilation of evaluation outcomes and meeting with leadership team

Example: An educational institution is seeking ways to integrate ecological principles and social equity into courses in design and technology. In a two-day workshop, Creative Change leads educators through hands-on activities on topics such as life cycle analysis, ecological design principles, and the links between the economy and the environment. During the sessions, educators review age-specific curricula and resources, and evaluate ways projects can be integrated into existing instruction to meet achievement goals. After collecting data on faculty needs and interests, Creative Change meets with the leadership team to develop a strategic plan as part of a Level II program.

Level II) Plan the Change: 3-6 month planning phase

Level II programs provide 3-6 months of strategic planning to help institutions define goals, strategies, evaluation, and a timeline for integrating energy into the curriculum. The work is guided by our *Sustainability Integration Framework*, a tool to support needs assessment, strategic planning, and evaluation. The framework addresses professional development, leadership, and other factors affecting the successful integration of sustainability.

Level III) Begin the Change: Semester- or year-long programs to revise or create units, courses or programs

Level III programs provide professional development, curriculum licensing and ongoing support to revise curriculum, courses and programs. Spread over a year or more, a typical package includes:

- 3-5 days of on-site professional development
- Multiple days of follow-up support and planning assistance
- Group license to the Curriculum Resource Center
- On-line evaluation and compilation of outcomes

The Curriculum Resource Center (CRC) is our digital content library of sustainability courses, units, and instructional resources. Materials are designed to support the integration sustainability into the curriculum, and are aligned to Common Core and Next Generation standards.

Example: After completing Levels I and II, the same institution works with Creative Change on a year-long initiative to integrate a broad range of ecological design topics into the existing curriculum. The initiative unfolds in three steps: A) on-site professional development, B) instructional redesign, and C) evaluation and communication.

Step A) On-site Professional Development (PD)

Workshops begin by immersing teachers in content knowledge and research-based pedagogical strategies. To model effective approaches, the sessions engage staff in hands-on activities they can replicate with their students, followed by thoughtful analysis and discussion. Activities include:

- Life cycle analysis
- Hands-on simulations of entropy and other scientific concepts
- Explorations of design principles used by plants and animals ("biomimicry")
- Inquiry about the accumulation of toxins in living organisms ("body burden")
- Critical analysis of ads and "greenwashing" techniques

Through these activities, educators define how the content and approaches can improve learning. The staff then evaluates their existing units or courses and sets goals for reshaping them. The science and health teachers collaborate on a unit exploring electronics, disposal, and the health aspects of heavy metals. An economics teacher focuses on subsidies affecting the manufacturing of "greener" materials, while the geography teacher examines the global impacts of e-waste and cultural attitudes affecting it. All efforts integrate social equity by exploring connections among race, class and environmental risks. The staff works together to generate authentic ways students can apply their learning, such as a computer recycling campaign in partnership with the city, or student-led outreach to local citizens about environmental health.

Step B) Instructional redesign

The PD now shifts to the on-ground work of redesigning units and courses based on the goals set. Creative Change's approach to instructional design provides educators with a framework for planning units that unfold as a narrative in which students are characters, the community is the setting, and ecological design topics form interconnected subplots. Throughout the redesign process, instructors access lessons, model units and instructional design tools from the Curriculum Resource Center, providing support to:



- Align instruction and assessment around transdisciplinary "Big Ideas".
- Develop questioning strategies to promote critical thinking.
- Support literacy and writing skills through content instruction.
- Design and use assessments that have a real audience and purpose.
- Utilize rigorous content and pedagogy.

As faculty continues their work, Creative Change provides on-going support through phone, email, Webinars, and in-person meetings (when possible). For example, Creative Change helps a teacher team connect with local ecological design stakeholders and develop specialized assessment tools to ensure the project meets achievement goals.

Step C) Evaluation and communication

By the end of the year, the educators' efforts have resulted in a collection of instructional modules that demonstrate best practices in content and pedagogy. The faculty has evaluated the impacts of its work and wants to replicate the approaches in other areas of the curriculum. To support this, Creative Change compiles evaluation data into a report to communicate results to internal and external stakeholders. Based on the success of the work, the collaboration with Creative Change grows to other departments or schools through a Level IV program.

Level IV) Sustain the Change: *Extended initiatives to build internal capacity and maintain effective change*

Level IV programs enable schools and districts to build internal capacity and institutionalize successful approaches. Clients gain training, resources and strategic planning assistance focused on preparing an internal team to lead, evaluate, and sustain instructional change. These packages, spread over two or more years, typically include:

- Multiple days of on-site professional development focused on “training the trainer” (preparing staff to lead internal PD)
- Strategic planning assistance to set and monitor goals
- Technical support with evaluation, documentation results, and communication materials
- On-going communication and planning with administration/leadership team

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