Engineering for One Planet

Engineering for One Planet Framework:

Comprehensive Guide to Teaching Core Learning Outcomes

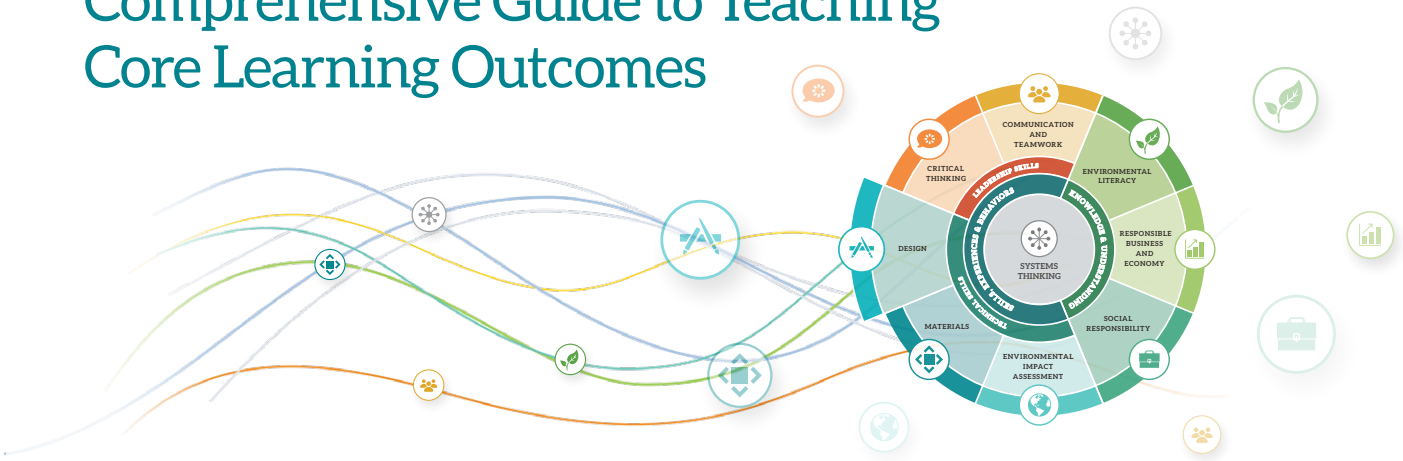
Powered by **The Lemelson Foundation**

EOP Resources

Background & Introduction

Engineering for One Planet Framework:

Comprehensive Guide to Teaching Core Learning Outcomes



This guide serves as a companion to the **Engineering for One Planet (EOP) Framework**.

Purpose:
This guide is designed to minimize the activation energy needed to engage students with the EOP Framework and serve as a "how to" guide for implementation of all 47 core learning outcomes outlined in the framework.

Whether you are an experienced educator or new to teaching sustainability-related topics, the suggested activities will serve as a resource for you. We have shared learning activities and key resources for each of the core learning outcomes for the nine topics of the EOP Framework (i.e., Systems Thinking; Environmental Literacy; Responsible Business and Economy; Social Responsibility; Environmental Impact Assessment; Materials; Design; Critical Thinking; Communication and Teamwork). Some examples refer to the **EOP Framework: Quickstart Activity Guide**.

For more integration examples, refer to **this chart** from our partner, VentureWell.

Please see the **EOP Framework** for an explanation of the icons used in this guide.

The Lemelson Foundation (2026). Engineering for One Planet Framework: Comprehensive Guide to Teaching Learning Outcomes. Cynthia Anderson, Cindy Cooper, and Dustyn Roberts (Eds). The Lemelson Foundation, Portland, Oregon, USA.

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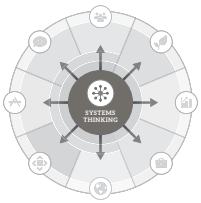
Systems Thinking



Resources:

- Whole System Mapping
- Inventing Green: A Toolkit for Sustainable Design
- Planetary Boundaries
- Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist
- A Healthy Economy Should Be Designed To Thrive, Not Grow
- Systems Thinking: A Cautionary Tale (Cats in Borneo)

Systems Thinking Core Learning Outcome 1

Explain interconnectedness (e.g., intersecting, related, and/or connected systems; human actions, infrastructure, and global environmental, climate, and social impacts, risks, future impacts, and consequences; synergies and rebound effects) and how all human-made designs and activities rely upon and are embedded within ecological, physical, climate, and social systems. ○ (2, 4) (4, 11-13, 17)

Integration Examples

Direct students to reference 1 content and videos, and reference 2 pg 10 (A Systems Approach). Discuss associated examples in links above in small groups on or offline.

Refer to the Systems Thinking examples in the EOP Framework: Quickstart Activity Guide.

Systems Thinking Core Learning Outcome 2

Analyze dynamic impacts and interactions between and among different parts of the system (i.e., social, environmental, economic, physical, political, and cultural considerations), feedback loops, unintended consequences, and cross-sector dependencies, and how interactions impact design and operational decision-making. ○ (1, 2) (9, 11-13, 17)

Integration Example

Direct students to reference 2 pg 13 (A Systems Thinking Tool - Sustainability Assessment for Innovators). Review assessment (starts pg 18). Consider the 3 phases: 1) Supply Chain, 2) Product Use, 3) End-of-Life.

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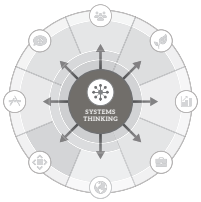
Systems Thinking



Systems Thinking Core Learning Outcome 3

Apply relevant concepts and frameworks from across disciplines to the study of real-world problems — and their solutions — with ethical discernment and empathetic consideration for uncertainties; communities/societies, environmental, energy, and climate justice; and cultural awareness. ○ (2, 4) ◌ (4, 10, 13, 16, 17)

Integration Example

Read reference 4 (excerpts or in its entirety) and/or watch associated TED talk (reference 5). Discuss how doughnut economics is similar to and/or different than other economic systems (e.g. capitalism) in terms of environmental justice.

Systems Thinking Core Learning Outcome 4

Create solutions that are viable, inclusive, and equitable and that consider the scale of the activity/product/infrastructure relative to local ecosystems and planetary boundaries (i.e., carrying capacities, tipping points, environmental and social thresholds and allocations, etc.); consider the potential roles of bio-inspired, nature-based, and regenerative solutions. ○ (2, 4) ◌ (6, 7, 9, 11, 12-15)

Integration Example

Read reference 3. Evaluate existing solutions for maintaining existing planetary boundaries that have not yet been exceeded and/or reversing the planetary boundaries that have already been exceeded.

Systems Thinking Core Learning Outcome 5

Create designs that include communities/societies, environmental ecosystems, and the diversity of life they sustain while keeping systems dynamics concepts in mind (e.g., feedback loops, complex cause-effect chains, cascading effects, inertia, tipping points, legacy, resilience, adaptation, energy systems and flows, etc.). ○ (2, 4) ◌ (9, 11-15)

Integration Example

Direct students to watch reference 6 and refer to reference 2 pg 18. Implement all or part of the assessment on an existing business as a class, small group, or individual. Discuss, present, or report out.

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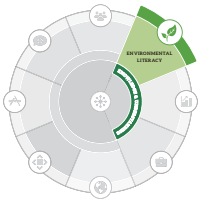
Environmental Literacy



- Earth Temperature Timeline
- Global Warming Preceded by Increasing Carbon Dioxide Concentrations During the Last Deglaciation
- A Reconstruction of Regional and Global Temperature for the Past 11,300 Years
- Circular Economy
- Ecosystems and Human Well-being: Synthesis

Environmental Literacy Core Learning Outcome 1

Demonstrate sustainability literacy — i.e., understand the interconnectedness of environmental, social, and economic systems; understand various definitions and historical contexts of environmental, social, and economic sustainability (e.g., United Nations Sustainable Development Goals, Brundtland report, Triple Bottom Line, Four Pillars of Sustainable Development, Earth Charter, etc.), greenwashing, greenhushing; understand the triple crises of equity, climate, and nature; be able to think critically and solve problems; promote sustainable practices; and participate actively in creating a safe, sustainable, resilient, and equitable world. ○ (4, 7) (1-17)

Integration Example

Identify one or more SDGs related to environmental challenges. Discuss existing efforts to address the chosen SDG(s).

Environmental Literacy Core Learning Outcome 2

Articulate whole life cycle and closed-loop systems thinking as related to the impact of their work (e.g., understanding of life cycle burdens of design alternatives). ○ (2, 4) (4, 9, 11-13)

Integration Examples

Read/watch content in reference 10, discuss.

Refer to the Environmental Literacy examples in the EOP Framework: Quickstart Activity Guide.

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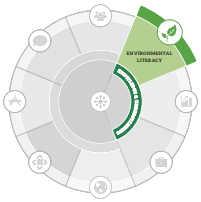
Environmental Literacy



Environmental Literacy Core Learning Outcome 3

Examine key global ecosystem cycles and services and Nature's Contributions to People (e.g., water, carbon, energy, and nitrogen/phosphorus cycles, as well as nutrient cycling, soil formation, pollination, waste decomposition, etc.), how they are interconnected, their relationship to nature, biodiversity, and climate change, and how they impact design solutions. ○ (1, 2) ◌ (6, 9, 13-15)

Integration Examples

- Read/watch content in reference 12, discuss.
- Read content in reference 12. Identify two ecosystem services and describe/discuss how they are interconnected.

Environmental Literacy Core Learning Outcome 4

Demonstrate energy literacy — i.e., understand the nature and role of energy sources (primary vs. secondary) and energy data (direct and indirect); how energy is used (embodied vs. operational); how electrical circuits work and are used (e.g., voltage, regulation, grids, microgrids, etc.); how efficiently energy is converted and stored (e.g., batteries); and how energy effectiveness strategies and energy-use decisions affect renewable use, carbon footprint, and overall energy used throughout the solution life cycle. ○ (1, 2, 6) ◌ (7, 9, 11-13)

Integration Example

- Review the seven essential principles and fundamental concepts of energy literacy of the energy literacy framework linked in reference 36 and/or watch one or more of the videos. Discuss new or surprising insights from these resources.

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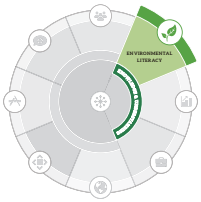
Environmental Literacy



Environmental Literacy Core Learning Outcome 5

Demonstrate data literacy — i.e., understand, assess, critique, verify, and effectively utilize data and reporting (e.g., United Nations Global Compact, Global Reporting Initiative, etc.) about environmental and social issues (e.g., biodiversity loss; climate change, carbon accounting, and greenhouse gas emissions; energy and water use; pollution and toxicity; air quality; waste management; etc.) including consideration for past/current/future and local/regional/global impacts and without greenwashing.
○ (4, 6) (4, 12-17)

Integration Example

Scroll through reference 7 and read linked articles reference 8 and reference 9. Discuss whether or not the illustration in reference 7 accurately represents the research presented in references 8 and 9.

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Responsible Business and Economy

- Inventing Green: A Toolkit for Sustainable Design
- Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist
- A Healthy Economy Should Be Designed to Thrive, Not Grow
- Business Sustainability Booster (BSB) for Business Model Canvas (BMC)

Responsible Business and Economy Core Learning Outcome 1

Recognize opportunities and demand for circular, inclusive, and sustainable business models, such as models that leverage product durability (e.g., renting, upgradeability, repairability, modularity, resale, etc.) and reduce energy and water usage, protect consumers and their privacy, reflect and include the interests and needs of diverse users and consumers, and reflect and include ethical, safety, and justice considerations. O (2, 4) (7-13)

Integration Example

Read through the Sustainability Assessment for Innovators in reference 2. Discuss whether or not this is a comprehensive list of considerations.

Responsible Business and Economy Core Learning Outcome 2

Examine risks and opportunities related to changing social, economic, political, ecological, energy, and climate systems on their work (e.g., extended costs, value, trade-offs, partnerships, regulations, policies, energy hotspots, etc.) exploring approaches to change from inside and outside of their experience, discipline, region, and country, etc. O (2, 7) (7-9, 11-13, 17)

Integration Example

Utilize the Sustainability Assessment for Innovators in reference 2 on a new or existing product.

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Responsible Business and Economy

Responsible Business and Economy Core Learning Outcome 3

Demonstrate awareness of how different revenue and business models can positively or negatively influence environmental and social systems (e.g., circular economy models, shared ownership models, service models, leasing with take-back instead of asset sales for planned obsolescence; employee-owned, public-private partnerships, business-NGO collaboration models, etc.). ○ (2, 4) ◌ (7-13, 17)

Integration Example

Read the content on Circular Economy in **reference 10** and the linked examples and complete the exercise linked there.

Responsible Business and Economy Core Learning Outcome 4

Demonstrate awareness of alternative forms of capital beyond financial resources (including natural/ecological, human, social, and physical resources) and their limits, and demonstrate awareness of emerging economic systems intended to promote environmental, social, and global responsibility in economic thinking (e.g., Doughnut Economics, circular economy, etc.). ○ (2, 4) ◌ (8-15, 17)

Integration Example

Read **reference 4** (excerpts or in its entirety) and/or watch associated TED Talk **reference 5**. Discuss how doughnut economics is similar to and/or different than other economic systems (e.g. capitalism).

Responsible Business and Economy Core Learning Outcome 5

Weigh the short- and long-term social and environmental costs and value of their work. ○ (2, 4) ◌ (8, 9, 11-15)

Integration Example

Refer to the Systems Thinking examples in the **EOP Framework: Quickstart Activity Guide**.

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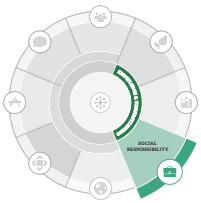
Social Responsibility



- Transforming Our World: The 2030 Agenda for Sustainable Development
- A Healthy Economy Should Be Designed to Thrive, Not Grow
- A Brief History Of How Racism Shaped Interstate Highways
- 'White Men's Roads Through Black Men's Homes': Advancing Racial Equity
- Stakeholder and Social Network Analysis
- Why So Few? Women in Science, Technology, Engineering, and Mathematics
- Ethical Issues with Social Impact Measurement

Social Responsibility Core Learning Outcome 1

Understand the United Nations Sustainable Development Goals as a framework for advancing social sustainability solutions and initiatives as a globally responsible designer/engineer. ○ (4, 7) (1-17)

Integration Example

Read through reference 13. Discuss any overlaps between the SDGs and the content or skills covered in your course.

Social Responsibility Core Learning Outcome 2

Recognize and empathize with ethical, climate, environmental, and social justice implications relative to social and cultural impacts of their work. ○ (4) (3, 5, 10, 11, 13, 16)

Integration Example

Read through reference 19. Discuss how collecting data to measure social impact has ethical implications.

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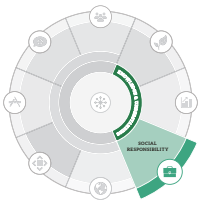
Social Responsibility



Social Responsibility Core Learning Outcome 3

Analyze how engineering activities directly and indirectly cause positive and negative social and cultural impacts throughout the design life cycle, both to workers producing the products (e.g., labor practices, livelihood, health, etc.) and to communities, society, and non-human life (e.g., resources acquisition, waste production and management, traditional/cultural methodologies, etc.). ○ (4) (1, 3, 5, 8-12, 16)

Integration Examples

Watch reference 5. Discuss the role engineers play in doughnut economics.

Refer to the Social Responsibility examples in the EOP Framework: Quickstart Activity Guide.

Social Responsibility Core Learning Outcome 4

Examine the ways in which some communities and populations (e.g., low income, children, elderly, women, people with disabilities, people of color, etc.) have historically been and continue to be negatively impacted and/or intentionally marginalized and underserved and continue to be disproportionately negatively impacted by engineering activities. ○ (4) (1, 3, 5, 10, 11, 13, 16)

Integration Example

Read reference 14 and/or reference 15. Discuss how engineering decision making affects marginalized communities.

Social Responsibility Core Learning Outcome 5

Evaluate the role of social responsibility and environmental, energy, and climate justice in the engineering profession (e.g., policies, laws, social justice, public health, national security, etc.). ○ (4) (3, 5-7, 10-13, 16)

Integration Examples

Read references 14 and reference 15. Explain how the legislation described in reference 14 attempts to correct previous policies that impacted marginalized communities.

Read reference 18 (full or excerpts). Discuss how social science theories of motivation influence sustainability.

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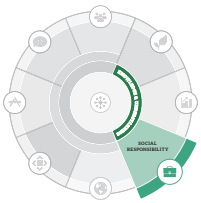
Social Responsibility



Social Responsibility Core Learning Outcome 6

Assess cultural, local, and global implications and influences in the context of their work (e.g., cultural expressions and sensitivities, services and goods procurement, heritage site appreciation, Indigenous Sovereignty, etc.) as well as equity awareness (e.g., gender, sex, race, ethnicity, sexual orientation, socioeconomic class, etc.). ○ (4) (5, 8, 10-12, 16)

Integration Example

Read through SDG #5 (Gender Equality) reference 13 and reference 17. Discuss the state of gender equality in engineering in your classroom, school, and/or community.

Social Responsibility Core Learning Outcome 7

Create robust, dynamic, and resilient social systems and transdisciplinary networks. ○ (2, 5) (8-11, 16, 17)

Integration Examples

Read reference 16. Discuss the steps and examples.

Read reference 16. Develop either a Stakeholder Analysis or Social Network Analysis for an issue in a local community.

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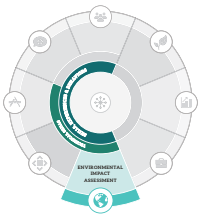
Environmental Impact Assessment



- Life Cycle Assessment
- Cradle to Cradle Certification
- EPEAT Certification

Environmental Impact Assessment Core Learning Outcome 1

Explain high-level environmental impact assessments (e.g., Life Cycle Assessments, carbon accounting, energy impact assessments, and life cycle hazards), how they work, their scope, what information they require, how to incorporate their findings, and why they matter. ○ (2, 6) ◌ (6, 7, 9, 11-15)

Integration Examples

Review Life Cycle Assessment (LCA) content and examples in reference 11. Review Cradle to Cradle content and examples in reference 22.

Refer to the Environmental Impact Assessment examples in the EOP Framework: Quickstart Activity Guide.

Environmental Impact Assessment Core Learning Outcome 2

Recognize current reporting standards, eco-labelling systems, and certificates (e.g., EPEAT, Energy Star, LEED, etc.) for sustainable production and consumption, including outside their geography, that could be used to improve their work. ○ (2, 7) ◌ (7, 9, 11-13)

Integration Example

Review EPEAT content and examples in reference 23.

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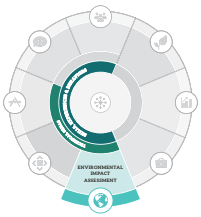
Environmental Impact Assessment



Environmental Impact Assessment Core Learning Outcome 3

Interpret assessment metrics and broader environmental, social, and economic implications of their work. ○ (2, 4, 6) ◎ (3, 7-9, 11-15)

Integration Examples

Review LCA content and examples in reference 11. Review Cradle to Cradle content and examples in reference 22.

Review LCA content and examples in reference 11. Choose one existing LCA. Determine the area of the largest environmental impact of a given product. Describe how difficult this area would be to minimize, what the likely cost would be, and how much it could be reduced.

Create an LCA on a new product (reference content and examples in reference 11).

Environmental Impact Assessment Core Learning Outcome 4

Examine complex or contradictory information to explain, prioritize, and make decisions among trade-offs (e.g., What are the cost, performance, and resource implications of the decision? Have relevant people been included in the process? Are marginalized and underserved communities part of the process and decision-making? Who and what will be most impacted by the decision?). ○ (2, 4) ◎ (8-13, 16, 17)

Integration Example

Review LCA content and examples in reference 11. Choose one existing LCA. Determine the area of the largest environmental impact of a given product. Determine at what scale the cost of minimizing environmental impact is feasible.

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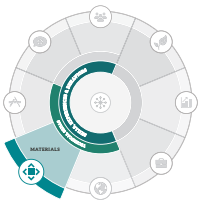
Materials



- Finding Greener Materials
- Swapping in Greener Materials
- Physical Properties of Materials, Choosing Green Materials
- How to Design for Social Impact: 4 Tips for Complex Challenges

Materials Core Learning Outcome 1

Identify potential impacts of materials and materials design (e.g., embodied and operational energy, energy demand, greenhouse gas emissions, toxicity, natural resource use, labor impacts, etc.) through materials screening and selection process throughout the supply chain and life cycle — from raw material extraction through manufacturing, use, reuse/recycling, and end of life — with a focus on making design and operational decisions to minimize negative impacts to nature and all life. ○ (1, 2) ◌ (6, 8, 9, 11-15)

Integration Example

Review content in reference 24. Choose one of the resources like the Ecolizer LCA Lookup Table. Choose two different materials and discuss the relative environmental impacts of production, processing, and recycling or waste treatment.

Materials Core Learning Outcome 2

Recognize current environmental assessment research and gaps in data and research for materials, materials screening and selection, materials design, and materials systems. ○ (7) ◌ (9, 11-15)

Integration Example

Choose one topic within environmental assessment (e.g., carbon emissions). Use Google Scholar or other available library database to find 2 journal articles published within the last 3 years on the topic. Discuss the assessments.

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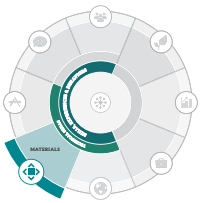
Materials



Materials Core Learning Outcome 3

Critique the environmental and social impacts and audits of design-appropriate materials (e.g., technical considerations including strength, weight, cost, toxicity, extraction impacts, material compatibility, thermal and structural properties, among others) as part of the screening and selection process with a sustainability ethos, including materials, systems, and processes to make decisions about whether to use existing or design new materials. (1, 4) (8-15, 17)

Integration Examples

Read reference 27. Discuss whether or not all design has social impact.

Read reference 27. Pick an existing product and redesign it to minimize environmental impact or improve the social impact (or both!).

Materials Core Learning Outcome 4

Compare materials properties (e.g., chemical, physical, and structural properties using thermodynamics, kinetics, the interrelated materials tetrahedron, etc.) aligned with sustainable design end-use application. (1, 2) (7-9, 11-15)

Integration Example

Review content in reference 24 and reference 25, and watch reference 26. Choose one of the resources like the Ecolizer LCA Lookup Table. Choose two different materials and compare the material properties and performance.

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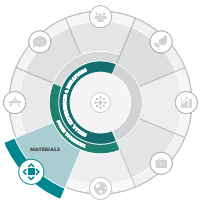
Materials



Materials Core Learning Outcome 5

Demonstrate sustainable design literacy — i.e., select materials for design alternatives and trade-offs that enable a long functional lifetime, promote circularity, support nature-based and regenerative solutions, reduce energy consumption and reduce/prevent hotspots, have net zero greenhouse gas emissions impact, cause minimal or no environmental and social harm, and/or are restorative to social, cultural, and environmental systems. ○ (2, 4) (4, 7-9, 11-15)

Integration Example

Choose an existing product (or part of one) made from an industrial material. Evaluate options for greener materials (using resources in reference 24 and reference 25) and evaluate whether a lower impact natural material could be used.

Materials Core Learning Outcome 6

Design with materials to create product and infrastructure solutions that are regenerative and/or reduce negative social and environmental impacts (e.g., consider natural materials) with an aligned understanding of traditional industrial materials (e.g., iron, steel, aluminum, etc.) and innovations that reduce fossil fuel consumption (e.g., recycled steel, green concrete, etc.). ○ (2, 4) (7, 9, 11-16)

Integration Examples

List 5 natural materials and 5 industrial materials. Using resources in reference 24 and other materials databases as needed, compare and contrast one physical property of each (e.g., yield strength).

Refer to the Materials examples in the EOP Framework: Quickstart Activity Guide.

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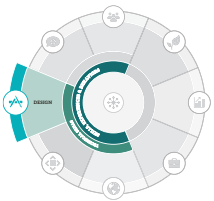
Design



- Introduction to Persuasive Design
- Life Cycle Assessment

Design Core Learning Outcome 1

Execute technical analyses (e.g., Life Cycle Assessment, Techno-Economic Assessment, etc.) to choose strategies that maximize positive impacts and minimize negative environmental and social impacts to achieve design and operational goals. ○ (2, 6) ◌ (7-9, 11-15)

Integration Examples

Based on an existing LCA (see reference 11 for refrigerator example) decide what the best design goal would be to minimize environmental impact.

Create an LCA on a new product (content and examples in reference 11).

Design Core Learning Outcome 2

Design — including materials design — using a systems thinking approach for the environment and society based on discipline-specific technical skills and circular design strategies (e.g., light-weighting, repairability, durability, upgradeability, disassembly, reuse/recycling, flexibility, resiliency, extreme affordability, for part or whole recovery to eliminate waste, etc.). ○ (2) ◌ (7-9, 11-15)

Integration Examples

Based on either a new or existing LCA, develop an improved product using one or more of the technical skills listed in the learning objective.

Refer to the Design examples in the EOP Framework: Quickstart Activity Guide.

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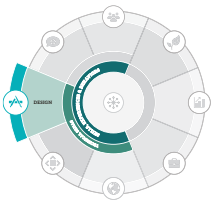
Design



Design Core Learning Outcome 3

Create long-term, systems thinking-based approaches for tackling urgent challenges (e.g., climate mitigation and adaptation), preventing negative environmental and/or social impacts (e.g., reduction in greenhouse gas emissions, reduction in energy and resource use, greater resilience, etc.), including use of innovative and disruptive solutions within supply chains, design of new technologies and materials, use of nature-based solutions, etc. (2, 4) (7, 9, 11-17)

Integration Example

Watch reference 28. Identify an example of creative/persuasive design in an existing product. Evaluate the effect of persuasive design on the environmental impact of that product.

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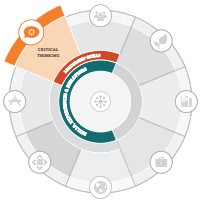
Critical Thinking



- Changing Lifestyles
- The Role of Individual Responsibility in the Transition to Environmental Sustainability
- A Brief History of How Racism Shaped Interstate Highways
- Critical Thinking and Sustainable Development
- Empathy, Place, and Identity Interactions for Sustainability

Critical Thinking Learning Outcome 1

Define problems comprehensively with consideration of uncertainties and long-term environmental and social consequences, both intended and unintended. ○ (1, 4) ◎ (3, 8-15)

Integration Example

Read reference 14. Discuss what the intended and unintended consequences of expanding the highway system were.

Critical Thinking Learning Outcome 2

Practice being self-reflective, valuing and guarding the environment, being empathetic, bringing an inclusive mindset, and cultivating intercultural competence to advance equitable and effective change for all life. ○ (4) ◎ (5, 10, 11, 13, 16)

Integration Example

Read reference 33. Discuss why empathy is important to sustainability.

Critical Thinking Learning Outcome 3

Understand that their values are both shaping and being shaped by the designs, technologies, and innovations they create, implement, and scale. ○ (4) ◎ (4, 9, 11-13, 16)

Integration Example

Read reference 32. Discuss how critical thinking on sustainable development influences values.

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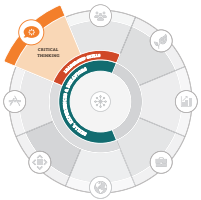
Critical Thinking



Critical Thinking Learning Outcome 4

Recognize that every person has a role in sustainability and climate resilience planning and action, and has the right and need to be informed about the environmental/social/economic impacts of the products they purchase, consume, and discard, including the understanding of fossil fuels as the main cause of climate change. ○ (4) ◌ (4, 11-13)

Integration Example

Read reference 31. Discuss individual roles in sustainability.

Critical Thinking Learning Outcome 5

Examine social norms, cultural values, and implicit biases that underlie their behaviors (e.g., normative thinking, cognitive dissonance, etc.) and how these influence ethical and equitable decision-making and adaptive responses to sustainability challenges, including climate change. ○ (4) ◌ (5, 10-13, 16)

Integration Example

Refer to the Critical Thinking examples in the EOP Framework: Quickstart Activity Guide.

Critical Thinking Learning Outcome 6

Critique complex ethical, cultural, and values-based thinking and choices, employing empathy and considering justice when evaluating conflicts of interest, trade-offs, timescales, and uncertain knowledge within problem constraints. ○ (4) ◌ (5, 10-13, 16)

Integration Example

Review content in reference 30 (including videos). Evaluate the pros and cons of some kind of sustainable choice, like riding a bike. Then, determine ways to mitigate anything on the cons list.

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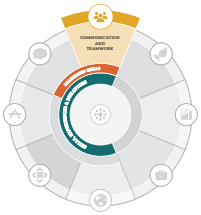
Communication and Teamwork



- Peer Evaluation: The Original Comprehensive Assessment
- Leadership Tips, Tactics, and Advice

Communication and Teamwork Learning Outcome 1

Communicate using culturally appropriate and audience-specific written, graphic/visual, oral, storytelling, and/or interpersonal communication skills (e.g., clear, concise, calls to action, key takeaways, etc.) to define the problem, convey technical ideas to experts, non-experts, and decision-makers, and to negotiate, persuade, influence, and/or advocate for effective innovations and known solutions, principles, values, goals, and targets. ○ (3) ◌ (4, 5, 10-13, 16, 17)

Integration Example

Identify a class project, activity, or report that requires specific communication skills (e.g., written, graphic/visual, oral, etc.) for students to present their work. Have students present their work either individually or in small groups using the selected communication skill.

Communication and Teamwork Learning Outcome 2

Develop a culturally-sensitive and resilient identity (e.g., values, beliefs, morals, interests, self-efficacy, emotional intelligence, empathy, humility, courage, agency, tenacity, optimism, ethics-based personal code of conduct, navigating personal moral injury and dilemmas, self-learning, etc.) that supports wellbeing, ecological belonging, and creative leadership potential to enable and advance positive change through inspirational sustainability visioning, persuasion, and advocacy. ○ (4, 5) ◌ (3-5, 10, 11, 13, 16)

Integration Example

Take the 55 minute course in reference 35.

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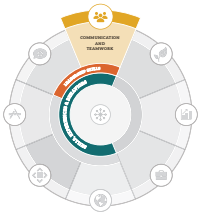
Communication and Teamwork



Communication and Teamwork Learning Outcome 3

Demonstrate ability to work within, empower, and function well on teams and across disciplines (e.g., actively engage, ask questions, listen with a willingness to process and learn, navigate tensions and complexity constructively, build coalitions, change roles, etc.) to advance sustainability initiatives. ○ (5) ◌ (4, 5, 8-13, 17)

Integration Example

Use the CATME Peer Evaluation in reference 34 along with a group project. Ideally you can use it early on in a project as a formative assessment, then at the end of a project as part of a summative assessment.

Communication and Teamwork Learning Outcome 4

Demonstrate self-awareness and understanding of unconscious bias that may impact environmental and climate equity and justice. ○ (4) ◌ (5, 10, 11, 13, 16)

Integration Example

Refer to the Communication and Teamwork examples in the EOP Framework: Quickstart Activity Guide.

Communication and Teamwork Learning Outcome 5

Prioritize projects, schedules, and time, and manage people justly, equitably, and inclusively. ○ (5) ◌ (5, 8, 10-12, 16)

Integration Example

Identify a class project that requires multiple steps to complete. Create a schedule for completion and (if working in groups) assign sub-tasks to different team members.

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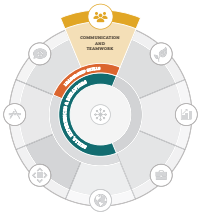
Communication and Teamwork



Communication and Teamwork Learning Outcome 6

Champion sustainability-focused values and approaches to maintain the integrity of design criteria across environmental, ecological, and human dimensions. ○ (3-5) (3, 4, 8, 9, 11-16)

Integration Example

Contact your local, regional, or state office of sustainability and identify a management contact. Create a plan to ask their management to partner with you on including sustainability-focused content in either curricular (coursework) or extra-curricular activities.

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Resources

EOP Resources are all available for free, online on the **Engineering for One Planet website**.

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Engineering for One Planet

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