



Zero Waste Curriculum Toolkit

Introduction

Integrating sustainability across the curriculum prepares this generation to be both global citizens and champions in addressing some of the biggest challenges we face. The workplace is rapidly changing as are employer expectations. Sustainability is now being driven into core businesses and is the lens through which companies assess their operations. During this century, more than 60 percent of new jobs will require a background in STEM, according to the [National Commission on Mathematics and Science for the Twenty-first Century](#). Additionally, the [National Environmental Education Foundation: Business & Environment Program](#) says that 65% of businesses value environmental and sustainability knowledge in job candidates and 78% said this knowledge would grow in importance as a hiring factor in the next five years.

The purpose of this toolkit is to prepare students for 21st century careers using sustainability as a solutions driver. This toolkit provides higher education faculty curated access to resources and processes, organized to aid in teaching about and engaging students in the concepts of zero waste. The materials can be adapted and scaled to fit a variety of class topics, degree programs, and student learning levels and provide content for experiential learning helping to prepare students for the needs of 21st century industry

These materials do not provide a prescriptive path or set curriculum, rather we encourage you to select resources that are right for your courses. These can be applied as teaching material, student assignments or as supplemental resources to share with the class. The materials are designed to support hands-on learning to address employers’ desire for stronger skills in critical thinking, complex problem solving, written and oral communication, and applied knowledge in real-world settings. (Source: [AACU 2013 Employer Survey](#)).

USGBC is here to help you apply these resources to your courses. Please contact us at education@usgbc.org to let us know how you’ve customized use of these resources to meet your course needs. Also, please let us know if there are additional resources that will further support your efforts. We look forward to hearing stories about your green building and sustainability courses.

Contents

- Zero Waste Overview..... 2
- TRUE Resources for Curriculum Development 2
- Locating TRUE Projects 3
- Suggested Lecture Topics..... 3
- Locating Subject Matter Experts and Guest Speakers 3
- Student Activity Ideas 4
- Content Resources..... 5
- TRUE Advisor Resources 7
- Additional USGBC and TRUE Resources and Opportunities..... 7
- USGBC Discounts for Institutions and Students..... 8



Zero Waste Overview

Zero waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Zero waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. Implementing zero waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health. (Definition from the [Zero Waste International Alliance](#))

Zero waste is a philosophy that encourages the redesign of resource life cycles so that all products are reused; a process that is very similar to the way that resources are reused in nature. Although recycling is the first step in the journey, achieving zero waste goes far beyond. By focusing on the larger picture, facilities and organizations can reap financial benefits while becoming more resource efficient. According to the EPA, the average American generates 4.4 pounds of trash each day, and according to the World Bank, global solid waste generation is on pace to increase 70 percent by 2025. For every can of garbage at the curb, for instance, there are 87 cans worth of materials that come from extraction industries that manufacture natural resources into finished products—like timber, agricultural, mining and petroleum. This means that while recycling is important, it doesn't address the real problem.

Throwing away waste is costly not only to the responsible organization. It is also very costly to the environment and society. The largest 5,589 publicly traded businesses in the United States sent 342 million metric tons of waste to landfills and incinerators in 2014. That is the equivalent of sending the weight of three Empire State Buildings to landfill every single day. ([Source](#))

Using a zero waste approach includes:

- Closing the loop by purchasing material made from recycling materials
- Preventing waste from occurring in the first place
- Pre-planning for what materials must be managed and ultimately disposed of
- Assessing the type and amount of these materials
- Seeking out practical ways to reduce, reuse and/or repurpose significant amounts of material preventing waste from occurring in the first place
- Composting as much as possible
- Recycling as much as possible
- Conducting these actions locally or within the nearby region

TRUE Resources for Curriculum Development

Are you building a curriculum addressing introductory concepts in zero waste? We encourage you to use these pages to ensure your lectures and activities include the most up to date information.

TRUE (Total Resource Use and Efficiency) changes the way materials flow through society so that all products are eventually reused and diverted from landfill, incineration (waste-to-energy) and the environment. TRUE Zero Waste certification is a program to assess performance in reducing waste and maximizing resource efficiency.



TRUE Zero Waste Rating System Resources:

- [TRUE website](#). Information about and resources for the TRUE Zero Waste Rating System.
- [TRUE resources](#). These include the TRUE Zero Waste Rating System, TRUE Zero Waste Application (w/scorecard) and a Guide to TRUE Zero Waste Certification. (Free to download).
- [TRUE Advisor certificate program](#). A professional certificate program that demonstrates an individual understands the requirements of the rating system, can help projects achieve TRUE certification and is committed to advancing zero waste values and policies.
- [Synergies between TRUE and LEED](#). Credits that can be substituted between TRUE and LEED for Existing Buildings.
- [TRUE Project Directory](#) - Summaries and photos from certified TRUE projects.
- [TRUE FAQ](#). Frequently asked questions.

Locating TRUE Projects

Exploring real TRUE projects is a great way to make zero waste concepts tangible for your students. Want to take the learning experience even farther? Have your students develop their own case studies about TRUE projects if available on your campus or in your community.

- [TRUE Project Directory](#). Summaries and photos from certified TRUE projects.
- Reach out to your local USGBC community and connect directly with TRUE projects and teams in your area. Search the [USGBC Organizations Database](#) by region to connect with USGBC near you.

Suggested Lecture Topics

- Discuss the history of waste and the definition and benefits of zero waste
- Walk through TRUE Zero Waste Rating System and discuss credits' intents and requirements.
- Compare TRUE to other green building and sustainability rating systems.
- Use the [TRUE Zero Waste Rating System](#) to identify how the credits address the overall goals and intents of the TRUE categories.
- Discuss synergies in policies, practices and credits within TRUE. Identify where a strategy implemented for one credit category contributes to the success in another.

Locating Subject Matter Experts and Guest Speakers

Invite local waste management and zero waste professionals to join your course as guest lecturers, jurors, or participants in charrettes.

Resources for locating professionals

- [TRUE Advisor Directory](#) to locate professionals trained on the TRUE Zero Waste Rating System.
- Municipality solid waste management website (EPA, state, city, region waste management)
- [USGBC Member Directory](#) links to USGBC member companies and their employees.
- [USGBC & GBCI Speaker Request Form](#) facilitates connections between USGBC representatives and your class.
- [USGBC Faculty Directory](#) presents a global network of credible, qualified instructors, teachers and facilitators who are go-to experts in sustainability across sectors, cultures and geographies.
- Some USGBC Faculty also support TRUE projects and can help to facilitate working with a project team for teaching purposes. Learn more about the [USGBC Faculty Program](#).



- Your own campus staff. Contact the campus staff/stakeholders that develop or support zero waste (or waste management policies and procedures (i.e., facilities and building managers; sustainability coordinators; purchasing agents; maintenance and sanitation staff; grounds keepers; food service operators, environmental, health & safety staff; green team volunteers, etc.)

Student Activity Ideas

The research shows the need for students to gain critical thinking and problem solving skills through hands-on learning. Nearly all employers (91%) agree that for career success, “a candidate’s demonstrated capacity to think critically, communicate clearly, and solve complex problems is more important than his or her undergraduate major.” And 96% of the employers agree that “all college students should have experiences that teach them how to solve problems with people whose views are different from their own.” (Source: [2015 AACU Survey](#))

Consider these activities to support hands-on learning of TRUE zero waste concepts.

Activities to generally introduce zero waste:

- Research your local community. Students explore opportunities that exist to support their work or interest in zero waste. Students share their discoveries about events they can attend, student or emerging professional networks to join, and other ways USGBC supports greening the built environment in their community. Reach out to solid waste staff at city, county and state along with federal agencies like EPA. Visit or interview local haulers, recyclers and composters.
- Create a mind map. Facilitate a mind mapping activity around the concept of “zero waste.” Students collaborate by adding ideas and associations that build off other’s ideas. Facilitate a discussion about how these ideas relate to others. What did others add that they would not have thought of? What diverse ideas or concepts emerged, and how might they be integrated?
- Explore career pathways. Research and identify job opportunities in zero waste (i.e., recycling and waste, processing, waste and zero waste policies, purchasing, etc.) especially for [TRUE Advisors](#). Use online search engines and job posting sites.
- Research your school’s commitment to zero waste policies and practices. Propose additional strategies and how TRUE can support these efforts. Plan to present these ideas to the institution’s leaders.

Activities related to the TRUE Zero Waste rating system:

- Read the article “[Zero waste strategies to get you started on your journey](#)” and discuss how to implement those strategies on your campus.
- Work on a TRUE project. Identify a project on campus or in the community. Attend project planning meetings and work with the staff to learn about planned TRUE goals and strategies.
- Visit a [TRUE certified project](#) and request a tour and interview relevant staff to learn about the strategies implemented and outcomes.
- Apply the intents of a TRUE category to a local facility. Consider a building on campus or in the community (e.g., dorm, labs, office building, lecture hall/classrooms, student center, retail space, etc.). For a TRUE credit category, identify the advantages and disadvantages of this facility in addressing the intents of that section. Identify what it would take to address the disadvantages in order to meet the intents.



- Conduct a Bin Right-Sizing assessment at a facility on campus.
- Conduct a Zero Waste Audit of campus facilities to assess opportunities in areas such as redesign, reduce, reuse, compost, recycle, diversion, reporting, leadership, training, analysis, upstream management, hazardous waste prevention, closed loop and innovation. Present findings and recommendations to relevant campus staff.
- Research other green building rating systems. Evaluate how they compare to and/or complement TRUE (e.g., [LEED](#), [WELL](#), [Cradle to Cradle](#)).
- Compare different TRUE certified projects. Compare/contrast the different criteria and elements based on project type, location, size, etc.
- Explore options for highest and best use of materials. Consider how to do this for items in the 12 Master Categories of Commodities/Discard (Reusables; Paper; Plant trimmings; Putrescible/food; Polymers; Wood; Ceramics; Textiles; Soils; Metals; Glass; and Chemicals).

Suggested student deliverables:

- Complete the *TRUE Zero Waste Assessment Activity*. Materials to support this are provided as part of the [Zero Waste Curriculum Toolkit](#).
- Create a public project profile with photos, videos, and project stories. Work with a certified TRUE project to highlight their sustainable features and tell their story via the [TRUE Project Directory](#) or a brochure, presentation, or live/ virtual tour.
- Create a proposed Environmentally Preferable Purchasing (EPP) policy or guidelines for the campus or a local community facility.
- Create a brochure or informational signage for a TRUE project. Create visually interesting, colorful graphics signage that informs visitors about that TRUE project.
- Create education or a video to train facility users or stakeholders on how to maximize the sustainable waste management features of the location.
- Create an employee zero waste guide to train them on the sustainable waste management features of a location.
- Create a presentation to share with campus sustainability staff or groups.
- Design a tour (in person or virtual) of a zero waste facility.
- Present on how a current registered LEED project could also achieve TRUE certification. (Resource: [Synergies between TRUE and LEED](#))
- Research and identify how a facility currently pursuing TRUE could earn additional points and higher certification level. Present findings via a report or a slide show.
- Deliver a presentation at a local industry conference or event.

Content Resources

We encourage you to consider the wide range of USGBC public resources that can be incorporated into your teaching materials. Contact education@usgbc.org to talk about how you can be creating innovative curriculum by accessing best-in-class content & resources for 21st century learning.

- [Zero Waste Glossary](#). (Located at the end of the TRUE Zero Waste Rating System)
- [TRUE Articles](#)
 - o [Infographic: The impact of 100 TRUE-certified projects](#)
 - o [TRUE-certified facilities are improving their bottom line](#)



- [Zero waste strategies to get you started on your journey](#)
 - [The Power of Zero](#)
- [Waste Eco-Audit](#) on LearningLab. This lesson is designed for 11 and 12 grade high school students but it contains valuable resources, teaching materials, and activities that could be adapted for college level students. [Learning Lab](#) is USGBC's online education platform for K-12 teachers and school leaders. (Note: The Waste Eco-Audit module is free; use your usgbc.org user account to log in and click on the link to purchase it for \$0)
- [Education @USGBC](#)
 - Utilize this resource by accessing *free* green building and sustainability content that includes:
 - [Green Campus Speed Training](#)
 - [Green Building for Everyone](#) (available [in Spanish](#) too)
 - Access content in the [Education @USGBC Subscription](#). Options include:
 - Purchase an individual subscription which gives you access to all the content plus the LEED v4 web-based reference guide, and hundreds of courses that can be used for your own professional development.
 - Require your students to purchase a subscription as part of their required course materials. USGBC offers exclusive student pricing allowing your students to gain access to content that supports their sustainability journey.
 - Speak with USGBC about a full access subscription for your institution which would benefit all instructors, staff and students. An annual subscription to Education @USGBC includes:
 - Ability to learn anytime from anywhere in the world, through online and offline access
 - Regularly refreshed content produced by USGBC and its Education Partners
 - The LEED v4 web-based reference guide and online credit tutorials
 - Ability to fulfill continuing education requirements for all LEED credentials
 - Streamlined CE reporting experience with automated CE hour reporting to GBCI and AIA
 - Ability to earn Knowledge-Based Badges: [Energy Efficiency](#); [Indoor Air Quality](#); or [Building Data Analytics](#)
- [USGBC's YouTube Channel](#).
- [USGBC+](#). USGBC's bi-monthly magazine with stories and strategies behind the world's greenest buildings. The current and archived issues are available [online](#) or as [print copies](#).
- Certificate of Completion Template. To provide students with formal recognition. (Included in the [Zero Waste Curriculum Toolkit](#).)
- External resources:
 - [Zero Waste International Alliance](#). The Zero Waste International Alliance is working towards a world without waste through public education and practical application of Zero Waste principles.
 - [Trash to Treasure: Changing Waste Streams to Profits Streams](#). Report from the U.S. Chamber of Commerce Foundation's Corporate Citizenship Center (CCC) to educate the private sector about the business value of circular economy opportunities.



- [WasteWise Resource Management](#). A program from the U.S. Environmental Protection Agency that encourages organizations and businesses to achieve sustainability in their practices and reduce select industrial wastes.
- [Waste Reduction Model \(WARM\)](#). A tool from the U.S. EPA U.S. Environmental Protection Agency that helps solid waste planners and organizations track and voluntarily report greenhouse gas (GHG) emissions reductions from several different waste management practices.
- [Volume-Weight Conversion Factors](#). U.S. EPA tool to help convert volume of material to weight and vice versa. It gives common weights of different materials per a unit of volume.

TRUE Advisor Resources

Prepare students to earn the [TRUE Advisor Certificate](#). TRUE Advisors understand the requirements of the rating system, help projects achieve TRUE certification and are committed to advancing zero waste values and policies. The certificate program is based on completing a course (12 on-demand, self-paced modules) and pass an online assessment.

Online resources:

- [TRUE Advisory Certificate Program Handbook](#)
- Article: [“Benefits of earning the TRUE Advisor certificate”](#)

Additional USGBC and TRUE Resources and Opportunities

- TRUE resources
 - [TRUE website](#): true.gbic.org
 - [Email subscription](#). Sign up at the bottom of the TRUE website page to stay informed.
 - [Press Kit](#).
 - [Twitter](#), [Facebook](#), and [LinkedIn](#). Connect via social media.
- USGBC resources:
 - [USGBC Higher Education](#). Go to place to receive the latest information on the resources and products to support higher education sustainability efforts on campus
 - [USGBC Contact Us](#). Submit outstanding questions about LEED or other USGBC programs.
 - [USGBC website](#). Information the U.S. Green Building Council and its programs.
 - [GBCI website](#). Information about Green Business Certification Inc., the administration of TRUE Zero Waste project certifications, professional credentials and certificates.
 - [Arc](#). This state of the art platform allows you to collect, manage and benchmark your data so you can improve sustainability performance.
 - [USGBC Student page](#). Encourage students to sign up for free usgbc.org user account and check off the “I am a student” box to receive discounts and access to additional resources. Encourage them to create a profile in the [USGBC Student Directory](#).
 - [USGBC’s Trademark Policy and Branding Guidelines](#). For guidance on correct use of and USGBC trademarked materials.
 - [USGBC Career Center](#). Searchable database of green building job openings



- Both USGBC members and nonmembers may create a [free usgbc.org user account](#) and create a public profile for the [USGBC Directory](#).
- Become a [USGBC Faculty](#) for up-to-date instructional resources, exclusive training opportunities to maintain your competitive edge in the market, and gain visibility across USGBC's digital platforms. Benefits include a complimentary [Education @USGBC subscription](#) and a complimentary GBCI CE course review.

USGBC Discounts for Institutions and Students

Currently, USGBC offers [student discounts](#) to individuals who indicate they are a student in their USGBC account. This includes discounts on some USGBC products including the [LEED v4 web-based reference guide](#) (\$50), [Education @USGBC subscription](#) (\$99), [publications](#) (USGBC member price) and the [LEED Green Associate exam](#) (\$100).

Looking for resources to teach about the concepts of sustainability, green building and LEED? Check out the other [Higher Education Curricular Toolkits](#) for resources and processes to aid in teaching about and engaging students in the concepts of sustainable design and construction, operations and maintenance, and green building rating systems such as LEED and SITES.

For additional Higher Education curriculum support or to provide feedback on these resources, please contact education@usgbc.org.