



# A Tour in Sustainability

By  
Earth Day Network

**Topic:** This lesson will explore two LEED certified green buildings and offer an educational tour of each for students to better grasp what a green building is in the physical sense.

**Class and Level:** Appropriate for all disciplines and ages, including Mathematics for calculated savings and energy use in addition to geometric architectural design, Engineering, Environmental Science, and Art.

**Unit Length:** One lesson period for class, another period for action's review.

## Goals and Objectives:

- Students will examine what is the LEED certification process and what constitutes a green building.
- Students will visually tour via the internet two LEED certified green buildings, while comparing and contrasting each building's design and its relation to their own homes or school building.
- Students will engage in hands-on activities to further green their school or homes.

## Assessment:

-Students must complete either an energy audit of their particular homes or as a group perform an energy audit on the school. If either is not feasible, students must analyze green themed cost-saving actions that could be enacted either in their school or home

**Warm-up:** Students will be questioned on their current knowledge of LEED certified green building standards and whether or not anyone has seen such a building. If so, discuss previous experiences. If not, share elements of green buildings, such as introducing and discussing compact fluorescent light bulbs or toxic-free paint. Subsequent to the discussion, introduce who is the US Green Building Council (USGBC) ([www.usgbc.org](http://www.usgbc.org)) and what they exactly do (LEED certification) in relation to the topic.

**Step 1:** Discuss what are LEED certification, the USGBC, and green buildings. A short synopsis can be found on USGBC's website: "The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ is the nationally accepted benchmark for the design, construction, and operation of high performance

green buildings. LEED gives building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.”

Continued from the USGBC's website for further information:

### **“How is LEED Developed?”**

The LEED Rating System was created to transform the built environment to sustainability by providing the building industry with consistent, credible standards for what constitutes a green building. The rating system is developed and continuously refined via an open, consensus-based process that has made LEED the green building standard of choice for nationwide.

### **What is LEED Certification?**

The first step to LEED certification is to register your project. To earn [certification](#), a building project must meet certain prerequisites and performance benchmarks ("credits") within each category. Projects are awarded Certified, Silver, Gold, or Platinum certification depending on the number of credits they achieve. This comprehensive approach is the reason LEED-certified buildings have reduced operating costs, healthier and more productive occupants, and conserve our natural resources.

### **Note for Product Manufacturers and Service Providers:**

Although USGBC does not certify, promote, or endorse products and services of individual companies, products and services do play a role and can help projects with credit achievement. (Note that products and services do not earn projects points.) [Learn more here](#) about how you and your company can help advance green building, while also achieving your own environmental and economic goals.

### **Who Can Use LEED?**

Everyone: Architects, real estate professionals, facility managers, engineers, interior designers, landscape architects, construction managers, lenders, government officials... The LEED program also includes a full suite of [training workshops](#) and a [Professional Accreditation](#) program to develop and encourage green building expertise across the entire building industry.”

A green building is defined by the City of Oakland's Public Works Department as: “a ‘Whole-Systems’ approach for designing and constructing buildings that conserve energy, water, and material resources and are healthier, safer, and more comfortable.”

In concrete terms, green buildings consist of one or the following:

- Using sun & wind to the building's advantage for natural heating, cooling, & daylighting
- Landscaping with native plants & using water efficiently
- Building quality, durable structures
- Insulating well & ventilating appropriately
- Incorporating salvaged, recycled, & sustainably harvested materials
- Maintaining healthy indoor air quality with appropriate building techniques & materials
- Using energy-efficient & water-saving appliances & fixtures

- Reducing & recycling construction waste

**Step 2:** Take a tour (Remember, research to see if there is a green building in your area, if so, we encourage you to take your students there to learn first hand).

A. The first is a video with detailed descriptions oriented to the building, which hosts the organization Alliance for Sustainable Colorado, located in Denver, CO. (7min.):

<http://www.alliancecenter.org/tour.html>

B. Virtually Green offers several other tours on the web, such as Cleveland's Environmental Center or a Forensics Lab in San Mateo County, CA:

<http://www.virtuallygreen.com/vtbs/php/>

Discuss the interactive and physical qualities of both tours. What did you learn? Is this something you could do at your home or school? What about specific aspects, such as light bulb replacement, could you perform such a task to green your house or school? Compare and contrast your school's appearance, structure, and materials in relation to the tours that were just viewed. What are some differences or similarities? How could your school or house be improved based upon the tours as a model?

**Step 3:** Take action. Identify something that you as an individual or the class as a whole can do to either green your school or home. An excellent starting point for greening one's school is a recently released report entitled: "Greening America's Schools: Costs and Benefits" found at: <http://www.cap-e.com/ewebeditpro/items/O59F9819.pdf>  
If you have any questions along the way or want to learn more about green buildings, feel free to ask an expert at: <http://greenresourcecenter.org/AskAnExpert.php>.

As far as an action that Earth Day Network strongly promotes; do an energy audit of your school (<http://www.bpa.gov/corporate/KR/ed/energyaudit/homepage.shtml>). Find out where the energy is coming from, what are the monthly rates and usage, and what are the steps that can be done to mitigate both the costs of the school and the environmental consequences. Advocating for the replacement of the light bulbs in your school is a good place to start; it benefits the environment and your school in the long run with reduced energy consumption equaling more costs eliminated. In fact, make a requirement that any savings from greening the school should be reinvested in providing a better education and facility for you!

In essence, students should create their own ideas for improvement based upon their personal settings and experiences with the teacher guiding the way. An energy audit is not the end all of green buildings. For example, examining water usage or instigating a recycling program all produce a greener school and planet!

If one wants to learn more about the materials involved in building green buildings, an excellent resource is the National Building Museum's website and current exhibition:

“The Green House” at

<http://www.nbm.org/Exhibits/greenHouse2/greenMaterials/materials.html>

Another resource based on the National Building Museum’s website and exhibition details different houses around the world employing green building standards in different ecosystems: <http://www.nbm.org/Exhibits/greenHouse2/innovation/innovation.html>

**Conclusion:** The action segment of this lesson, depending on its feasibility, interests of the students, and time issues, may take any extra lesson period. In fact, it is something the whole school can be involved in. Students must demonstrably manifest the assessment to the teacher in some fashion; this can be in the form of a written assignment, journal notes, class discussion where everyone must participate at least once, group work presentation, etc... One more avenue for exploration is partnering with any class, such as Science or Math, so that the calculative and science-based learning would correlate with the history of green buildings or their societal impact and growth. Comprehension of green buildings is an interdisciplinary matter, thus we encourage collaboration across the curriculum.



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