

**Context:** Many forces have combined to encourage (and in some places, require) recycling and energy conservation. These forces include the cost and availability of raw materials; and the costs and effects of energy extraction, production, and transportation. Also important in the push to recycle and conserve energy is the aim to leave our communities and the world in as clean and pollution-free a state as possible for future generations. **How sustainable is your school? How does math inform an environmental analysis?**

**Project:** After researching energy usage and recycling plans, audit your school's energy usage, recycling practices, or other pressing environmental problem. Present your written audit report to the school and invited guests with a companion multimedia presentation format

**Approach:** You may have seen or heard about "green" buildings, created with all-recycled materials and using very little non-renewable energy for heating, cooling, and lighting. As landfills, where garbage is dumped, get close to capacity, communities are requiring households and businesses to recycle more and more of the items that all of us have just tossed away in the past.

One way to learn more about the value of recycling and conserving energy, and to make a difference in this effort, is to pick a location where you have some control of resource use. How much is recycled there? How is energy used? Are there any obvious ways to improve recycling efforts and energy usage? And how can you model and calculate how both recycling and energy usage could be improved for this location?

This project will take you through this energy-audit cycle, with a focus on a portion of your school building. Can you think of other places where you could conduct a similar audit?

**Expert Involvement:** local civil engineers, green contractors, EPA

**Tools:** watt meter, environmental tests

<b>Primary Standards: Oklahoma Science Standards</b>
HS-ESS3-2 Evaluate competing design solutions for developing, managing, and utilizing natural resources based on cost-benefit ratios.*
HS-ESS3-3. Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
HS-ESS3-4 Evaluate or refine a technological solution that reduces the impacts of human activities on natural systems.*