

# LAUNCH for Long Beach Toolkit: Energy Audit

Slay the energy vampires at your school by conducting an Energy Audit!

An energy vampire is a device that continues to use energy and drain power, even when it is turned off. Use this toolkit to discover where energy is being wasted and what can be done about it to help mitigate climate change and (bonus!) save money.

Within this toolkit, you'll find various downloadable resources. For your convenience, you can access them all in one place by scanning the Toolkit Resources QR code on the last page to view them in a Google Drive folder.

This toolkit was created in partnership with the City of Long Beach Utilities.

Want to use this toolkit in español? Scan the QR code to the right!



Have you registered?



Versión en español:



## Toolkit Details

The card is green with white and yellow text. At the top left is the 'GRADES of green LAUNCH Eco-Toolkit' logo. The title 'Energy Audit' is in large white font. Below it is the text: 'Where does energy come from and how can you help conserve it? Check out our Energy Audit Eco-Toolkit today!'. To the right is an illustration of a wall outlet with a lightbulb icon and the text 'Save Energy'. Below the main text are four columns, each with an icon and text: 1. 'Skill Level' with a puzzle piece icon, 'Grades K-5, led by a teacher, parent or school administrator'. 2. 'Climate Crisis Topic' with a globe icon, 'Energy' and a plug icon. 3. 'Project Time' with a calendar and clock icon, 'Up to one hour, ongoing throughout the year'. 4. 'What You'll Need' with a toolbox icon, 'Writing utensil, Energy Audit Worksheet (provided), & clipboard'.

## NGSS

This toolkit address the following Science and Engineering Practices (SEPs) within the Performance Expectations of NGSS for Grades K-2 and 3-5:

- Asking Questions and Defining a Problem
- Planning and Carrying out Investigations
- Analyzing and Interpreting Data
- Using Mathematics and Computational Thinking
- Constructing Explanations and Designing Solutions
- Obtaining, Evaluating, and Communicating Information

## Why It's Important

Using too much energy from non-renewable resources harms our planet – and causes climate change. It is also a big waste of money, which is important in schools where funds could be reallocated towards programs that benefit the students instead. Overconsumption of energy harms our planet – it is a direct cause of the climate crisis.

## What You Will Accomplish

- Students will become more aware of where energy comes from and look out for energy drainers in their environment.
- Students will learn about renewable vs. non-renewable energy.
- Students will study ways to save energy by unplugging appliances that do not need to be plugged in while not in use.

## How Auditing Your Energy Usage Will Benefit Long Beach

Energy audits reveal areas where energy is being wasted or used poorly. By addressing these issues and implementing energy-efficient practices, you can reduce your school's overall energy consumption. When you use less energy, you will help the City of Long Beach by reducing its demand on landfills for natural gas or methane and its dependency on oil drilling!

## Learning Objectives

### Analysis

- Students will analyze a classroom/school building(s) for energy use

### Project Management

- Students will practice collection, analysis, and presentation of data
- Students will create schedules to conduct audits
- Students will exercise effective communication and accountability

### Evaluation and Assessment

- Students will track and evaluate the information they have collected

## Educator Project Plan

**Follow the steps below to set up a successful Energy Audit at your school! Need help? Email us at [info@gradesofgreen.org](mailto:info@gradesofgreen.org)!**

Track your metrics and submit your impact after implementing this toolkit. Your feedback helps keep our programs free for all across the globe.

## Choose Participants

Use our Energy Audit Sign-Up Sheet Template

- A Student Group (such as a club or before/after school program)
- A whole class
- The whole school

Energy Audit Sign-Up Sheet:



### Pro Tips:

- Working with a small group of students (1-6 students)? Start with a single classroom audit.
- Working with a larger club/class (6-24 students)? Split up into teams to audit different classrooms OR create a schedule to audit the same classroom on a weekly basis.
- Is your whole school participating? Split up into teams by classroom or grade level to audit your entire campus.

## Why Should You Reduce Your Energy Use?

The resources provided can be shown as a slideshow (see the QR code on the next page) or printed out as individual worksheets for students to learn.

### Our Energy Comes from Fossil Fuels

Today, energy sources such as oil, coal, and gas make up 80% of our energy use. They are called "natural gas" or "fossil fuels," and their use often releases chemicals and greenhouse gasses into the air. This causes air pollution and makes the air hotter, which is called global warming.

[1] Check out Chapter 2 of the Conservation Caper video from Long Beach Utilities on the next page!

### Vampire Energy

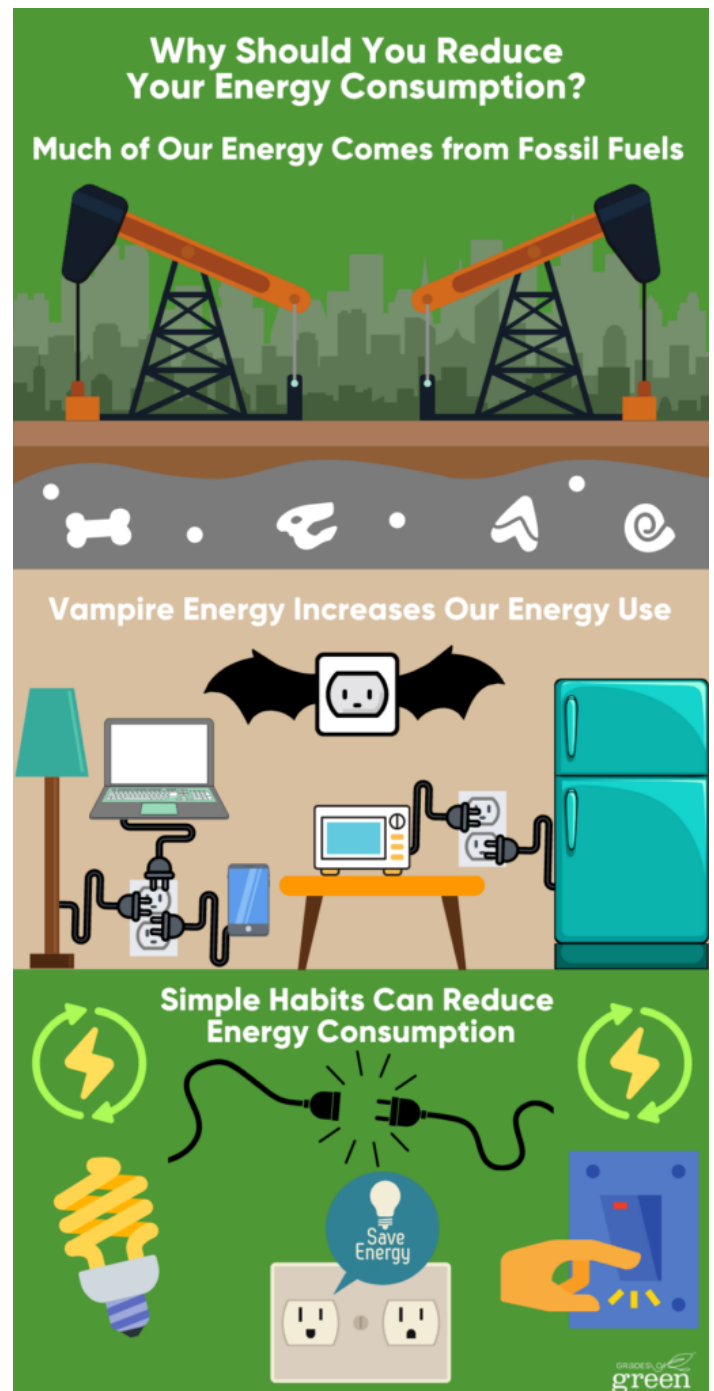
When an appliance is plugged in, it still uses energy, even if it's not turned on. This kind of secret energy sucking is called Vampire Energy. Studies have found that vampire energy use accounts for 5-10% of the total electricity in residential homes and accounts for about 1% of the world's carbon dioxide emissions. Appliances can be anything from a lamp, fridge, or an electric pencil sharpener. Some of these appliances have to be plugged in and turned on all the time, but there are others that can be turned off.

Additionally, vampire energy can be defeated by installing energy star certified appliances, which use less power than standard appliances. [2]

### Simple Habits Can Lower Energy Use

It's easy to save energy and lower pollution from fossil fuels. Some small changes include:

- Unplugging appliances that are not in use
- Using power strips that can be turned off at night
- Replacing incandescent light bulbs with LED light bulbs



- Install motion-activated light switches
- Leave curtains/windows open during sunny winter days and use blackout shades during hot summer days
- Before starting a garden project in your home yard, call 811 to make sure you know where the gas lines are to prevent a leak.

**Pro Tips:**

Check out more ideas to save energy in Long Beach by scanning the QR code to the right!

**Long Beach Energy Saving Ideas:**



**Why Energy is a Social Justice Problem**

Energy relates to environmental justice because of the way we get fossil fuel. The production, use, and digging up of fossil fuels has many negative effects on our environment. Areas where fossil fuels are taken out of the ground and used are called “sacrifice” zones because the health and well-being of the local people and the environment are treated like they’re not as important as getting to the fuel. The people that live in “sacrifice” zones are often people of color, and the decision to sacrifice the area is most often made by people who do not live in or near the area. Scan this QR code to learn more about Long Beach’s oil history.

**Long Beach’s Oil History:**



**Citations and Resources**

**Slideshow:**



**[1] - Today in Energy: Fossil Fuels**



**The Conservation Caper:**



**[2] - Energy Vampire Appliances:**



**Watch These Two Short Videos to Learn Why It’s Important to Reduce Energy Consumption!**



‘Vampire Power Awareness from iGo’



‘Energy Saving Tips for Kids | How to Save Energy | What is Phantom Energy?’

## Think About It!

### Pre-Activity Questions

- Can you name some appliances or things in your house/classroom that are plugged in even if they're not being used?
- What do you think uses the most energy out of these appliances?
- What is the difference between renewable and non-renewable energy sources? Which has a more negative impact on the environment? A more positive impact?

## Take Action: How to LAUNCH Your Energy Audit

Lead students through the “Energy Audit” activity with guided instructions. Check out “Pro Tips” with each step for useful help.

### 1. Assign Roles

Determine who and how many students/staff are participating. Divide students into roles using the Energy Audit Team Organizer:

- **Walk Through Lead:** Student will lead the team throughout the room and note sources of energy use.
- **Notetaker:** Student(s) completing the Energy Audit Worksheet.
- **Appliance Watch:** Student(s) will keep track of any new appliances introduced throughout the week/month/ school year.
- **Floater(s)** (if teams need to be in groups of 4): Assists other roles and reviews Energy Audit Worksheet accuracy before weekly team transfers.

Energy Audit Team Organizer:



Energy Audit Worksheet:



### 2. Prepare Your Materials

Gather the following materials and determine a safe place to store them when not in use:

- Clipboard
- Energy Audit Worksheet
- Pencil
- Location to store materials

### 3. The Pre-Audit

Before you conduct your scheduled Energy Audits, you must first determine how energy is currently being used in your chosen location. Using the Energy Audit Pre-Project Analysis worksheet, write down what appliances are being used in addition to how many plugs/outlets are utilized.

Energy Audit Pre-Project Analysis Worksheet:



## 4. Make a Schedule

- How many audits will take place?
- Which team will conduct the audit (if you have more than one team)?
- When will the audits take place?
- What classroom(s) or building(s) will be audited?

Use the Energy Audit Monitoring Schedule to complete this task.

### Energy Audit Monitoring Schedule:



## 5. The Audit

Use the Energy Audit Worksheet to conduct your audit. The team will walk through the room and write down the number of:

- Outlets
- Power strips
- Appliances plugged in and on
- Appliances plugged in and off

The team will then talk with the teacher about what appliances in the classroom can be unplugged *when they're not being used*. At the end of the audit, put the materials in the chosen storage area in the classroom.

In addition to the audit, the following duties should be conducted to ensure a consistent workflow:

- Students on "Appliance Watch" will monitor any new appliances that come into the classroom and write them down on the worksheet.
- The working team will then meet with the next team at the end of the weekly cycle to discuss any updates.

### Energy Audit Worksheet:



### Pro Tip:

Creating team names is a fun way to get creative! Choose energy-themed team names to challenge the energy vampires!

## Reflection Questions

### How'd It Go?

#### Student Reflection

- What surprised you the most about this audit?
- Now that you have identified energy vampires at school, can you think of appliances in your home that are using vampire energy and what can be unplugged when you're not using them?
- How do you think you can make the next audit even better?



# Report Students' Impact

Congratulations!! You've implemented your Energy Audit! Don't let all that hard work go unnoticed. **Submit your results by scanning the QR code below.**



Project ongoing? No problem! Let us know what you've done so far.

By reporting your impact, Grades of Green can:

- CELEBRATE and elevate your students' hard work and success.
- Offer our programs FREE for all students across the globe.
- AWARD stipends and certificates to hard-working educators and students.

Please take a few minutes to submit your results. Thank you!

## Provided Resources

Energy Audit Sign-up Sheet:



Energy Audit Team Organizer:



Energy Audit Pre-Project Analysis:



Energy Audit Monitoring Schedule:



Energy Audit Worksheet:



Energy Audit Slides:



Energy Audit Wrap-Up Form:



Toolkit Resources – Google Drive Folder:



**Congrats on completing the Energy Audit Eco-Toolkit!**

**Did you enjoy this toolkit? Find your next project below!**

