

Engaging Students in Energy Efficiency

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How can you
engage
students and
generate
interest in
energy and
resource
conservation?



Typical Attributes of Middle School Students

- Expanding awareness of environmental issues
- Preference for hands-on activities
- A desire for self-expression and self-determination
- A sense of HUMOR!

The Green Police



What kinds of specific activities can be used for students to understand how schools use energy and water?

Lessons and Activities

Sustainability

Career Exploration

Measuring Energy Usage

Lighting Survey

Lot's of free curriculum available
online to download or request

- *PG&E Energenius Program*
- *NPR - "It's All About Carbon"*
- *The NEED Project*

El Dorado County Career Technical Partnership

Energy Audit Activities
for Middle School Students

Building Energy Audit Project Lessons

Career Exploration Energy Auditors

Reading passage and questions

Video: *Clean Energy Career Profiles*

Guest speakers from local utilities

- EID – El Dorado Irrigation District
- PG&E

EID Water Audit



EID Water Audit



Measuring Energy Usage “Finding the Vampires”

Students use
P3 Kill-A-Watt meters
to measure and document
Phantom Loads

P3 Kill-A-Watt Meter

- Instantaneous watts and amps
- Phantom Loads
- Total kilowatt hours
- Line voltage



Measuring Energy Usage

Refrigerator Study

Students use

P3 Kill-A-Watt meters

to measure and document energy used
by campus refrigerators





Measuring Lighting Levels Activity



Mini-Quality Environmental Meter

- Light measurement in lux
or ft-candles
- Air velocity in knot, km/hr,
m/s, mph, FpM
- Relative humidity
- Temperature

How can these activities be
tied into the regular
curriculum?

California Science and Technology Standards

Heat – Thermal Energy

States of Matter – Phase Changes

Nature of Light

Physical and chemical properties

Natural Resources

Renewable/nonrenewable sources of energy

Investigation and experimentation

What can students do with information on energy consumption that will allow them to actively participate in making their schools more energy efficient?

Student Projects

- Students “Making A Difference” ideas
- Podcasts or posters with energy saving tips
- Presentation to administration/school board with specific recommendations
- Join school or district Sustainability Team

Marina Village Energy Audit Action Team

S - Specific

M - Measurable

A - Attainable

R - Relevant

T – Time-based



Goal #1

Survey lighting on campus

Interior lighting accounts for almost **30%** of all electricity used in California schools



Goal #2

Identify and measure Phantom Loads

*Office equipment
accounts for
over 7% of electricity
used in California
schools*



Goal #3

- Schedule and participate in a *Water Wise Business Call* with EID to identify and correct inefficient use of water



How will students and staff
access and evaluate the
effectiveness of their efforts?

Energy Star Portfolio Manager

- Interactive energy management tool
- Tracks energy and water consumption
- Identifies opportunities for energy efficiency improvements
- Tracks progress over time

- Feedback from district through email updates to staff
- Savings used to reduce effects of budget cuts
- District Sustainability Team outreach

How can energy and water consumption feedback be presented to students, staff and community?