A Common Core Approach to a PBL INSTRUCTIONAL UNIT The Power of Zero: Waste, Emissions and Energy

CPA/Solar Energy Academy Teachers
California Teachers Association/Institute for Teaching, Green Jobs Project

John Alvarez, Alex Gian, Padmini Kishore, Norma Williamson

Presentation Summary

- A multi-grade, multi-disciplinary science unit integrated with CTE (Foundations of Engineering), Geometry, World Languages and Language Arts
- A Projects Based Learning guided by Buck Institute for Education methodology (NOT sponsored by BIE) www.bie.org
- within the context of common core standards and a specially crafted writing performance task

Handouts Uploaded!

- Conference Website: https://2013.educatingforcareers.org
- Common Core Based Writing Performance Task connected to theme & CCSS information
- Project Based Learning Overview
- Buck Institute for Education Rubrics, Self-Assessment
- Earth Day Celebration: Zero Emissions Day, Bike, Walk to School, event flyer, participation form

Solar Energy Academy /Green Jobs Teacher

CPA "Bridge Fund " Sponsored Team

CTA Sponsored "Green Jobs" Team

At left, Kelly Horner, CTA/IFT Rep

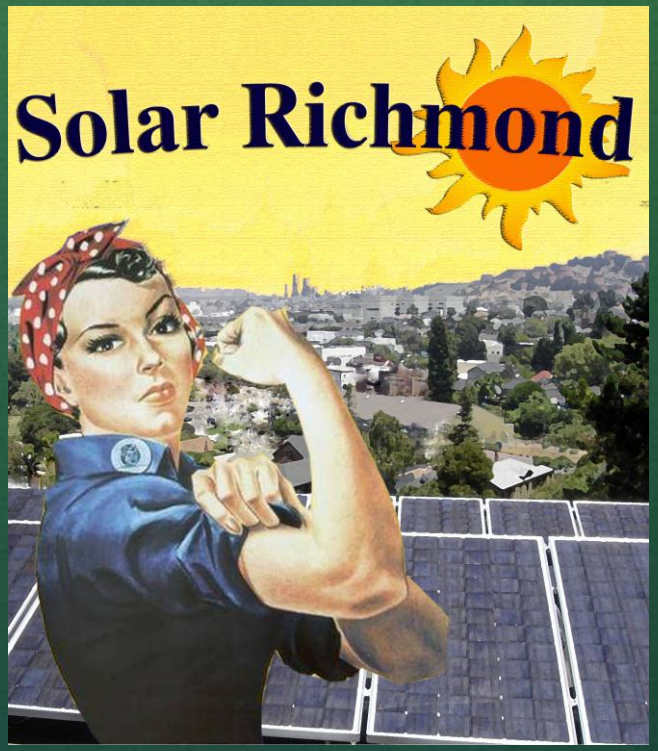
Eric Heins, CTA VP, visiting Green Jobs Students

Solar Energy Academy's Centerpiece

- **Solar Campus Security Golf Cart**

Advisory Board

- Earth Resources Foundation
- GRID Alternatives
- EE Solar
- Our 1 World
- Plug in America.org
- Cerritos College



Common Core
Going beyond *"C"*

Common Core College and Career Anchor Standards

College and Career Readiness Anchor Standards for Reading

The grades 6–12 standards on the following pages define what students should understand and be able to do by the end of each grade. They correspond to the College and Career Readiness (CCR) anchor standards below by number. The CCR and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students must demonstrate.

Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.
6. Assess how point of view or purpose shapes the content and style of a text.

Integration of Knowledge and Ideas

7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.*
8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of Reading and Level of Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.

*Please see "Research to Build Knowledge" in Writing and "Comprehension and Collaboration" in Speaking and Listening for additional standards relevant to gathering, assessing, and applying information from print and digital sources.

Note on range and content of student reading

To become college and career ready, students must grapple with works of exceptional craft and thought whose range extends across genres, cultures, and centuries. Such works offer profound insights into the human condition and serve as models for students' own thinking and writing. Along with high-quality contemporary works, these texts should be chosen from among seminal U.S. documents, the classics of American literature, and the timeless dramas of Shakespeare. Through wide and deep reading of literature and literary nonfiction of steadily increasing sophistication, students gain a reservoir of literary and cultural knowledge, references, and images; the ability to evaluate intricate arguments; and the capacity to surmount the challenges posed by complex texts.

Common Core College and Career Anchor Standards

- The grades 6–12 standards define what students should understand and be able to do by the end of each grade. They correspond to the College and Career Readiness (CCR) anchor standards by number. The CCR and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students must demonstrate.

Common Core College and Career Anchor Standards

Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Common Core College and Career Anchor Standards

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

Common Core College and Career Anchor Standards

Integration of Knowledge and Ideas (1 of 2)

7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

Common Core College and Career Anchor Standards

Integration of Knowledge and Ideas (2 of 2)

8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

Common Core
College and Career Anchor Standards

Range of Reading and Level of Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.

Common Core Reading Standards for Informational Text

Reading Standards for Informational Text 6–12

RI

The CCR anchor standards and high school grade-specific standards work in tandem to define college and career readiness expectations—the former providing broad standards, the latter providing additional specificity.

Grades 9–10 students:	Grades 11–12 students:
Key Ideas and Details	
1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
2. Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.	2. Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text.
3. Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.	3. Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.
Craft and Structure	
4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).	4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines *faction* in *Federalist* No. 10).
5. Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (e.g., a section or chapter).	5. Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.
6. Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose.	6. Determine an author's point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness, or beauty of the text.
Integration of Knowledge and Ideas	
7. Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.	7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.
8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.	8. Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., *The Federalist*, presidential addresses).
9. Analyze seminal U.S. documents of historical and literary significance (e.g., Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they address related themes and concepts.	9. Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features.
Range of Reading and Level of Text Complexity	
10. By the end of grade 9, read and comprehend literary nonfiction in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 10, read and comprehend literary nonfiction at the high end of the grades 9–10 text complexity band independently and proficiently.	10. By the end of grade 11, read and comprehend literary nonfiction in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literary nonfiction at the high end of the grades 11–CCR text complexity band independently and proficiently.

Common Core Reading Standards for Informational Text

Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Common Core Reading Standards for Informational Text

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).

Common Core Reading Standards for Informational Text

Integration of Knowledge and Ideas (1 of 2)

7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

7. Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.

Common Core Reading Standards for Informational Text

Integration of Knowledge and Ideas (2 of 2)

8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.

Common Core Reading Standards for Informational Text

Range of Reading and Level of Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.

10. By the end of grade 9, read and comprehend literary nonfiction in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the high end of the range.

Common Core Writing Standards

- Nuclear Power- ELA
- Crickets- MATH

Common Core
Speaking and Listening Standards

- Nuclear Power- ELA
- Crickets- MATH

Common Core Performance Tasks

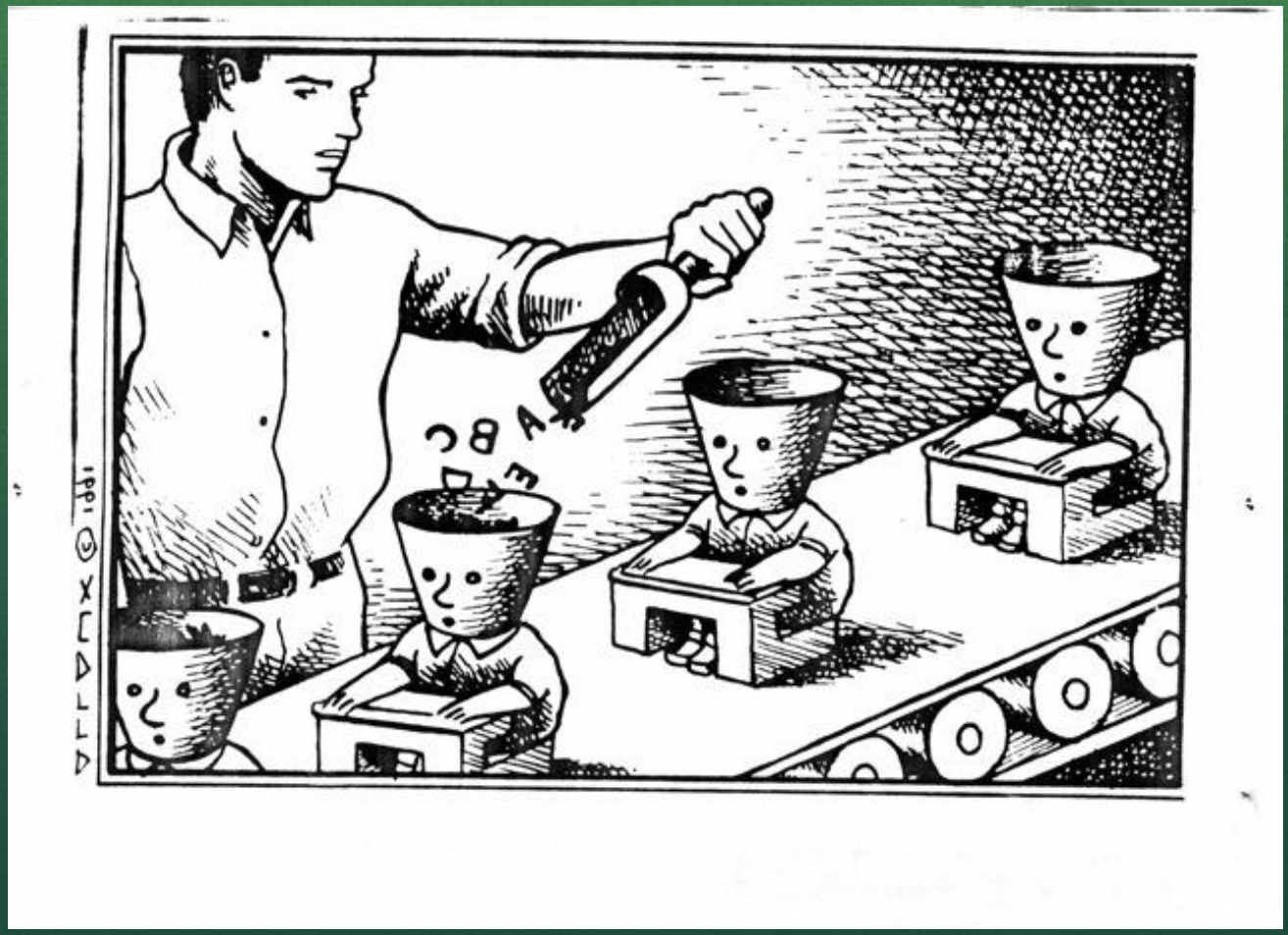
- Nuclear Power- ELA
- Crickets- MATH

Buck Institute for Education Project Based Learning is

- **Standards based**
- **Uses performance based assessments**
- **Integrates curriculum areas, thematic instruction and community events**
- **Meets the needs of learners with varying skill levels and learning styles**
- **Supports self-directed learning**

Summer teacher workshops for professional growth sponsored by California Teachers' Association/IFT grant

"Spoon Feeding or Authentic Engagement?"



PBL is NOT:

- A string of activities tied together under a theme, concept, time period, culture, geographic area, etc.
- "making something" or "hands-on-learning" or "doing an activity"
- It's not the "dessert"; it's the "main course"

District Administrator for CTE

What is Project Based Learning (cont)

- Students work as independently from teacher as possible
- Have some degree of "voice and choice"
- Build 21st century skills: collaboration, critical thinking and communication
- Engage in rigorous, extended process of inquiry focused on complex, authentic questions and problems.

Academy partner: Alan Williamson from GRID Alternatives

What is Project Based Learning?

- Instead of "text-book driven" curriculum, it's "meaningful question" driven curriculum
- Students explore and solve engaging real world problems, meet design challenges; OR take on fictitious roles in a scenario-based project: mock court
- Students work with other students
- Learn content and skills
- Create high quality products

Academy partner: Rio Hondo College Environmental Technology Instructor, Skip Ricarte

The Six A's Criteria for Designing Projects

- **Authenticity – real world connection, meaningful to the student, appropriate audience for student work**
- **Academic Rigor – curriculum standards addressed through this project; central concepts; habits of mind (precision of language/thought, etc.)**
- **Applied Learning – what students DO to apply their new knowledge to a complex problem, self-management skills**

Summer workshop: language arts, geometry, Earth science and biology teachers

The Six A's Criteria for Designing Projects

- **Active Exploration – field based activities (interviewing experts); sources of information students use to investigate (on-line services – parent permission)**
- **Adult Connections – outside adult experts (parent permission); worksite visits; classroom speakers**
- **Assessment Practices – the criteria used for measuring student outcomes, structured student self-assessment, timely feed-back on works in progress; culminating exhibition/presentation**

Biology teacher wiring solar modules

Assessment

- Tests, research papers, essays can be part of PBL
- Include formative assessment- feedback as the project progresses (learning log, concept maps, rough drafts, storyboards, etc.)
- Summative assessment – culminating appraisal of their end-of-project performance; use rubrics
- Parents, local experts, students can help evaluate
- Habits of Mind – successful behaviors of effective problem solvers, students self-assess
- Student sample on display

Outside expert, principal giving feedback on student presentations

Performance Based Assessments – Buck Institute for Education

1. Accessing Information Rubric
2. Composing Presentation Rubric
3. Critical Thinking Rubric
4. Group Process Rubric
5. Group Task Time Management Rubric
6. Habits of Mind Project Rubric (self-assessment)
7. Individual Task Management Rubric
8. Making Presentation Rubric
9. Oral Presentation I/II Rubric
10. Peer Collaboration Teamwork Rubric
11. Processing Information Rubric
12. Project Grading Worksheet

Developing a Project Idea

- From articles, issues, current events, conversations
- From discipline standards and benchmarks
- From issues of the local community
- From the work place
- From national, international controversies
- From students' interest
- From the web, Buck Institute for Education website

Best Part: Collegial Planning across content areas - algebra, language arts and world history teachers creating multi-discipline project learning unit

Characteristics of a Driving Question (Essential Question)

- Provocative or challenging to students – relevant, urgent, important to community, real-world dilemmas
- Open-ended and/or complex – no simple "yes/no" answers, no single "right answer"; requires students to integrate, synthesize information
- Linked to the core of student learning – consistent with curricular standards
- Local concern with action component

Administrators at planning meeting with language arts teacher

Driving Question

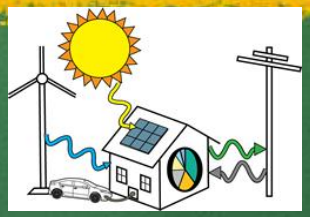
How can and why should a society, reach the standards of zero energy in buildings, zero emissions in transportation, zero waste in disposal?

Students viewing "Sparrow" Electric, 3 wheel vehicle at National Plug in Day

LMHS Students cleaning La Mirada Creek

Environmental Nature Center, Newport Beach

The "Power of Zero" in Mitigating Global Climate Change



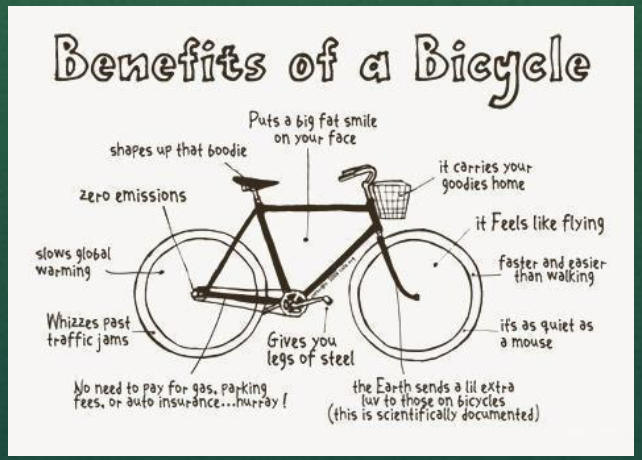
- Zero Net Energy in Buildings (a building that generates more energy than it consumes)

- Zero Emissions in Transportation
- Zero Waste in Disposal

- Within context of global biomes:
  - Amazon Rainforest
  - U.S. urban areas affected by Superstorm Sandy

What is Zero Emissions?

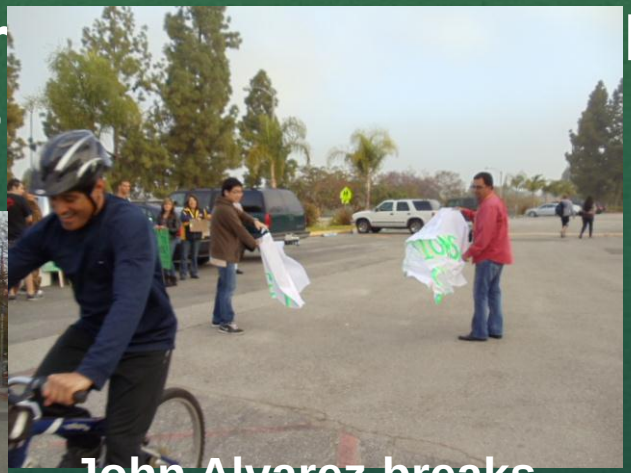
- An engine, motor or other energy source, that emits no pollutants or waste products that disrupt the climate.
- Solar powered, 100% electric vehicles are zero emissions: no tailpipes, no oil/smog checks
- Biking, walking are zero emissions, too!



ZERO EMISSIONS: Culminating Activities

- CTE/Foundations of Engineering students fabricate electric go-karts and charge from solar powered, portable charging station
- California Teachers Association – Sponsors "Zer k Walk to Schoo

Student at National Plug in Day viewing EV ↑



John Alvarez breaks thru Zero Emissions banner

Norma Williamson charges her EV from solar rooftop

WHAT IS ZERO ENERGY?

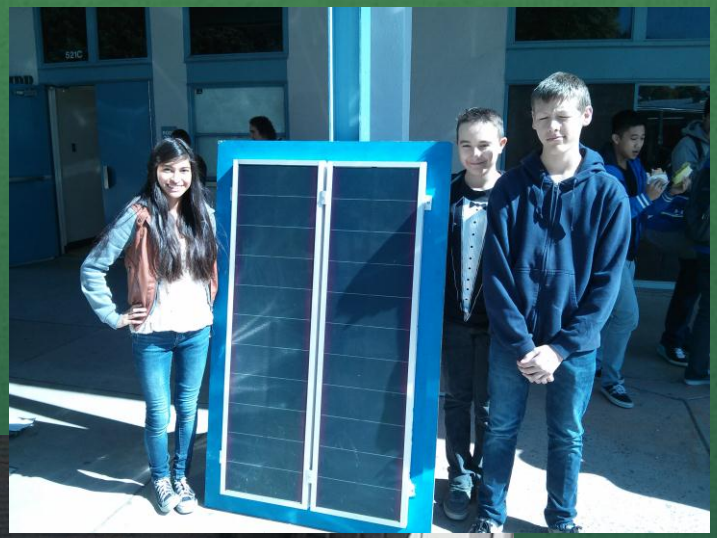
- A structure or product that generates as much energy to the grid as it uses from the grid.
- Students visited Environmental Nature Center, Orange County's first LEED Platinum Building

LMHS Students reading LEED info.

LEED Standards met by ENC: Energy, Materials, Insulation (recycled blue jeans)

Zero Energy
LMHS Culminating Product

CTE, Foundations of Engineering students fabricating portable solar charging station to charge student built electric go-kart

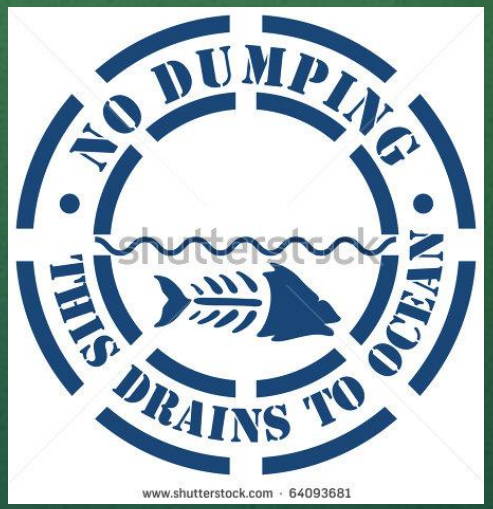


Students next to solar panel facing south towards the sun for southern exposure

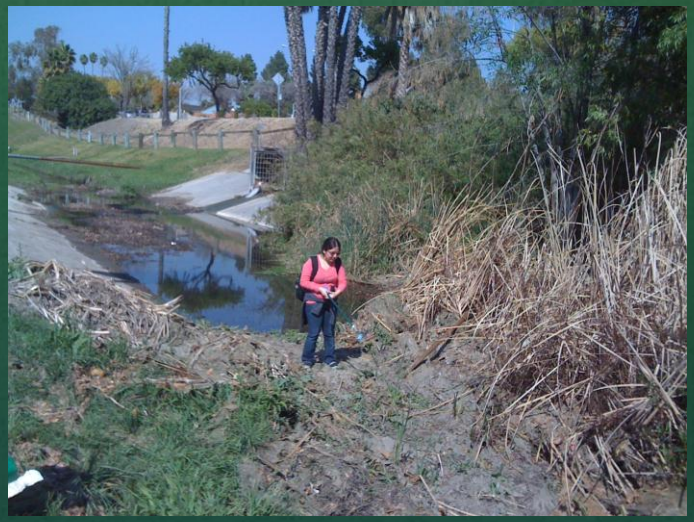
Students measuring voltage of battery and solar panels

What is Zero Waste?

- Zero Waste is a goal that emulates sustainable, natural cycles where all discarded materials are designed to become resources for others to use.
- Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.
- Source: www.zwia.org/standards.html



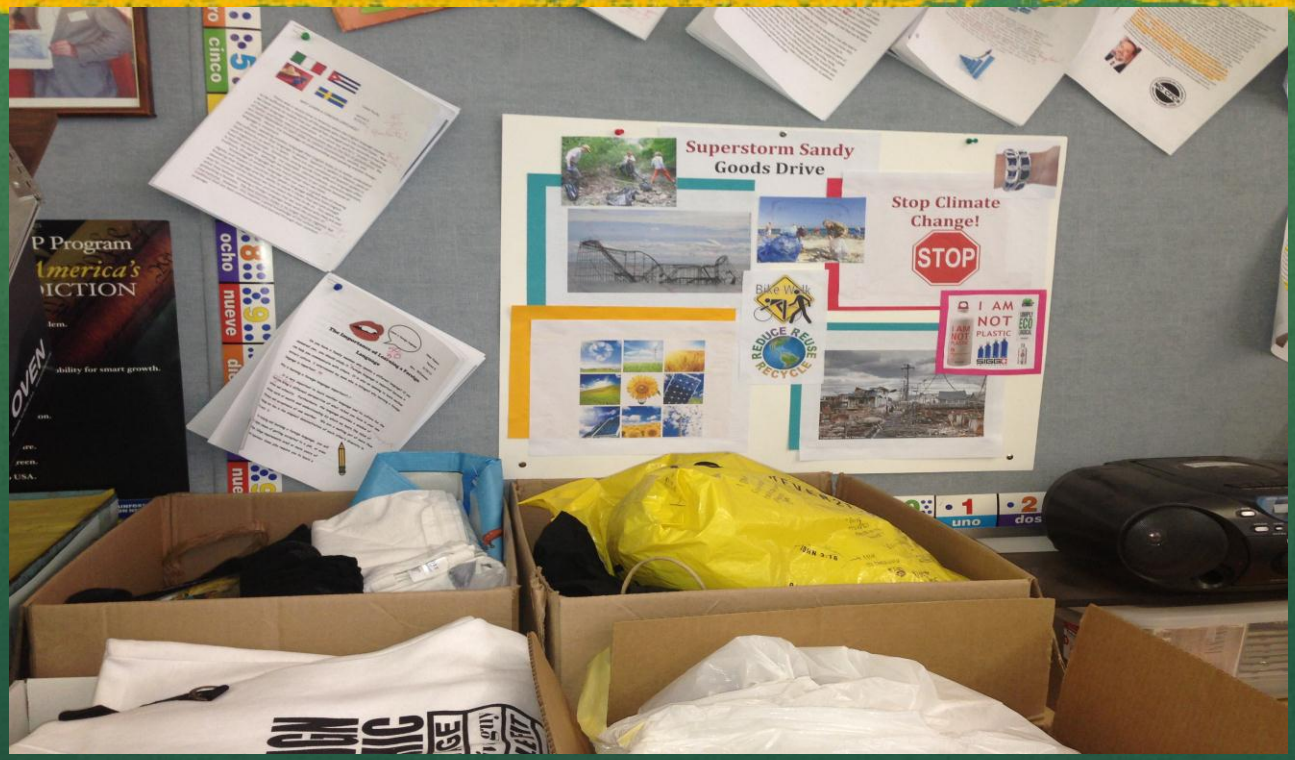
ZERO WASTE
Culminating Activities: La Mirada Creek Cleanups



Zero Waste Pull Tab Bracelets

LMHS students making pull tab bracelets

ZERO WASTE: SUPERSTORM SANDY GOODS COLLECTION



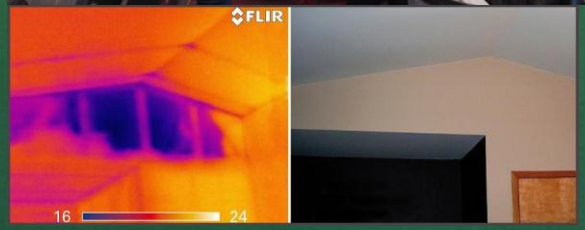
Student: “Why throw away good clothes, good items, when people affected by a climate related catastrophe can use them?”

BIE: Active Explorations

- Students exploring Williamson's zero emissions, 100% electric car, 2012 Toyota RAV4 EV

- Pluginamerica.org conducts "Electric Driveway Parties"

BIE: Outside Adult Experts Class Presentation



Zero Energy – Jeff Trirgoff, Home Energy Audit Expert showing: 1. “blower door” that measures home air leakage 2: thermal graphic image

Zero Waste – ACE, Jessica Marigoli, talking About importance of composting.

Zero Emissions – Tesla Owner, Linda Nicholes, Plug in America Co-Founder and LMHS AP.

BIE: Outside Adult Experts Teacher Training

- ACE – Alliance for Climate Education
- Presentation at Teacher Planning Days
- www.acespace.org

BIE : Entry Event/Outside Experts

- Kick off event: climate change awareness assemblies

Modern lifestyle is polluting!

- Free assemblies, periods 1 to 5
- 6 classes each period
- **Estimated attendance = 1,000 students**

BIE: Entry Event, Fieldtrip to Aquarium of the Pacific

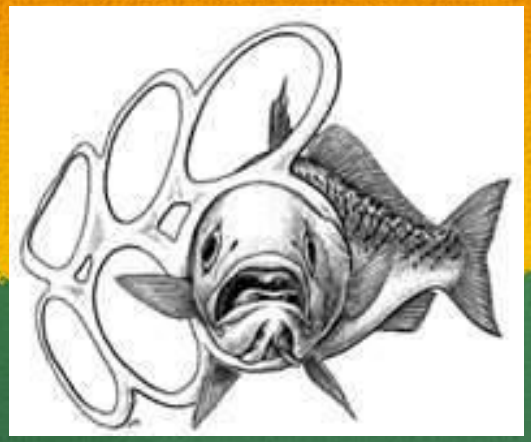
- 11 kilowatt solar energy system that will reduce electrical consumption by 14,000 kilowatt hours a year. ➔
- Zero Energy Dissection Lab produces more energy than it consumes ➘

My Trip to the Aquarium of the Pacific
Student: Haylee

What I Learned:

- Over a ton of waste is drained into our ocean killing thousands of species.
- Temperatures are changing due to over use of fossil fuels causing aquatic life to die or relocate.
- There is trash in our ocean as big as Texas.

“If we do nothing, there will be nothing.”



This or this

You decide!

Zero Waste & Zero Emissions is What You Can Do! - Haylee

- We can stop using so much plastic (recycle)
- We can stop throwing trash into the street! (most storm drains lead to the ocean.)
- We can stop using so much fossil fuels. (ozone is shrinking due to our over use of fossil fuels.)

YOU CAN MAKE A DIFFERENCE!!!

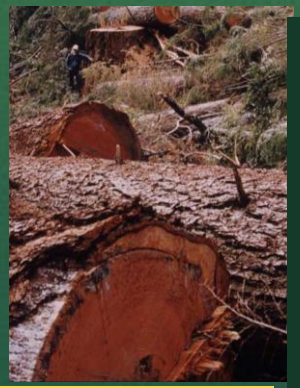
Focus on GREEN and Carbon Emissions

Biome Research Report Standards: Ecology Cluster

Students work on a research report on a natural biome of their choice and present their findings as PowerPoint presentations

Dr. Susan Newcomb, Literacy Coach, team-teaches for research skills and APA formatting style

A Sample Slide



- Carbon emissions are destroying the Northwestern coniferous forest.
- 50-90% of coniferous forests are going to be destroyed in the next 30-50 years because of the doubling of carbon emissions.

Focus on PHOTOVOLTAICS and Renewable Sources of Energy

GREEN PROJECT

SCRAP BOOK/POSTER/ MODEL/VIDEO

Sample scrap books

<u>Investigation standard on Energy Options Solar Energy/Green Jobs/Green Options</u>

- Students study their home, school and their city for Photovoltaics, renewable sources of energy and new methods to reduce carbon emissions
- They report their findings in the form of scrap books, posters, models or videos

CTE/Foundations of Engineering, 2012-2013

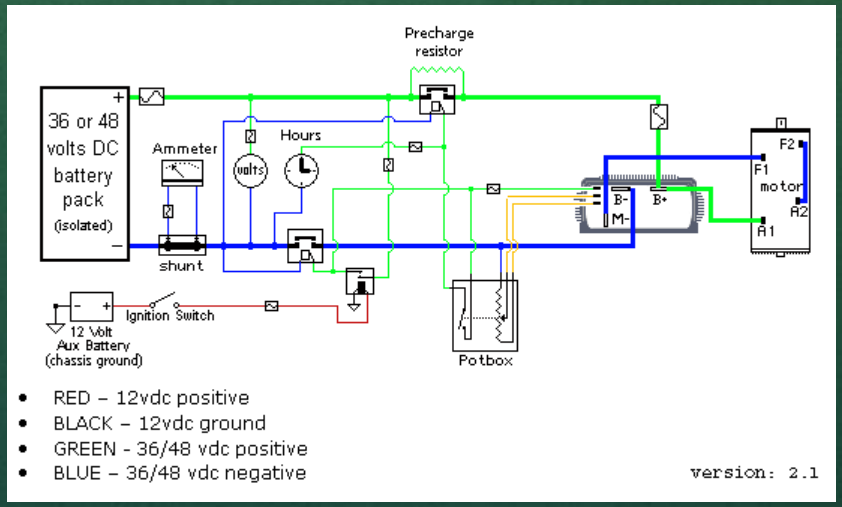
- *Career Technical Education: D1.1 D1.2 D1.3, Know the new and emerging energy resources used in residential, commercial energy and utilities. Know the advantages and disadvantages of energy resources used …in terms of their effects on the environment.*

Student measuring state of battery

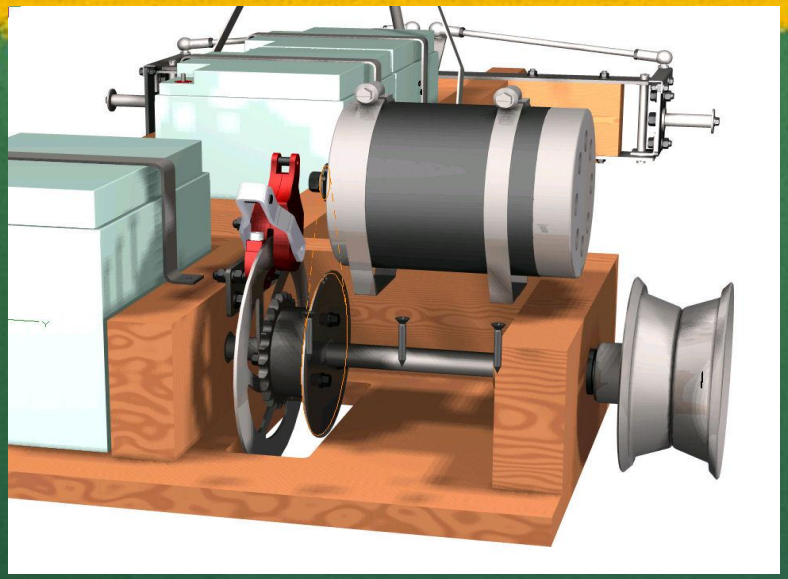
Solar Electric Go-Kart built by Engineering Students

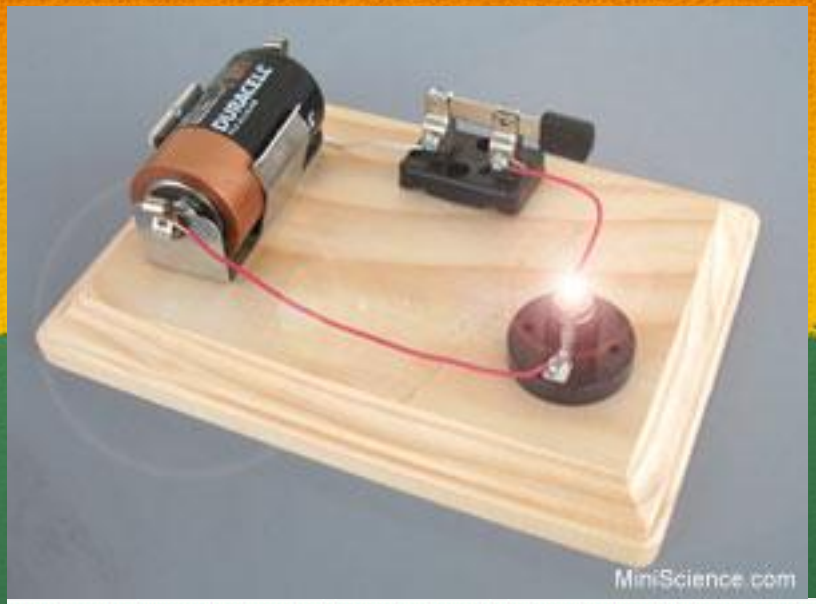
Future Engineering Lessons

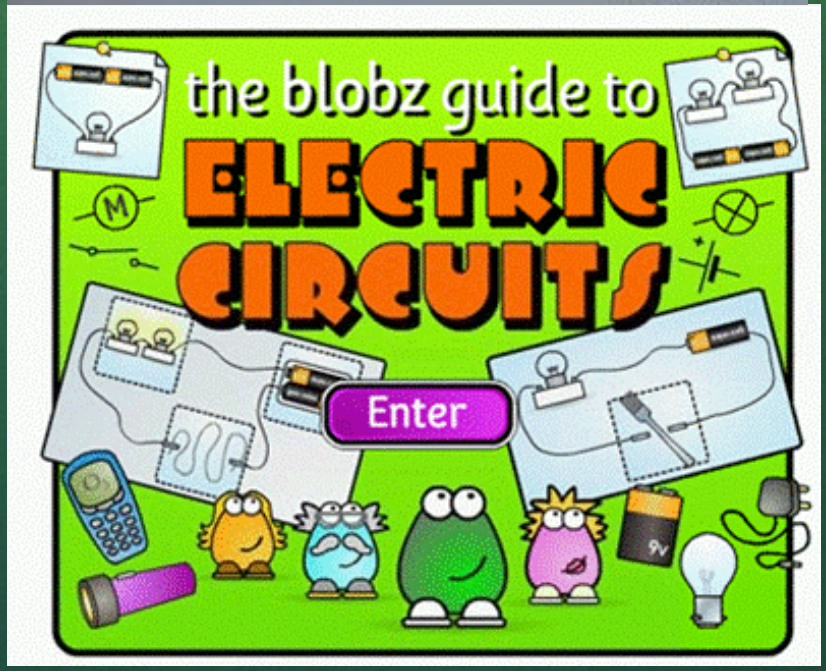
- Determining energy consumption to overcome friction and inertia
- Measuring load under constant acceleration
- Understanding basic electrical circuit involving resistors, capacitors, motors batteries.



Engineering Activities







Standard Set 5a: Students learn about voltage or current in simple direct current electric circuits constructed from batteries, wires, resistors, and capacitors" and identify in electric go-karts.

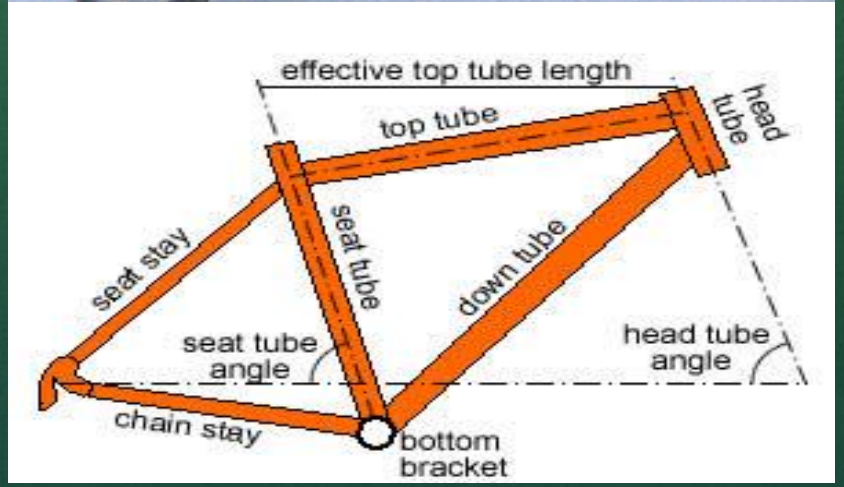
http://www.andythelwell.com/blobz/guide.html

Geometry

Standard 21.0: Students prove and solve problems regarding relationships among chords, secants, tangent, inscribed angles and inscribed and circumscribed polygons of circles.

- *Standard: CA State (1), Geometry, 8.0, p.42 Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.*

- Community Experts: College Engineering Student & retired electrical engineer/solar professional



E-Bike Geometry

- *Resources:* http://www.wikihow.com/Build-an-Inexpensive-Electric-Bicycle

- http://www.youtube.com/watch?v=adOLJAfyrvY

Zero Emissions Student Built Electric Bike

Zero Emissions when charged by solar charging station

Language Arts

Language Arts Standard: Structural Features of Informational Materials, 2.1, Analyze both the features and the rhetorical devices of different types of public documents and the way in which authors use those features and devices.

1. Press Releases written by students of school events
2. Letters to the Editor – school newspaper, community paper
3. Classroom Debates for and against climate change
4. Community experts as audience for classroom presentations

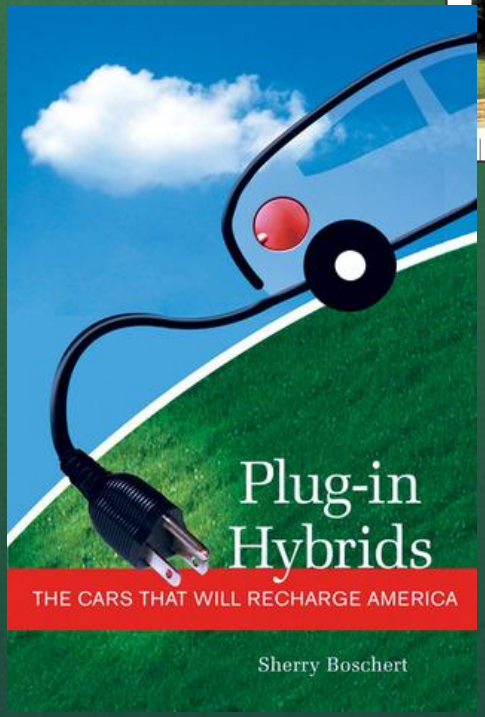
Language Arts

How to write a press release:
http://www.wikihow.com/Write-a-Press-Release

How to write a letter to the editor:
http://homeworktips.about.com/od/politicalscience/ht/lettertoeditor.htm

Read Solar Today magazine, Nov/Dec, 2006 (14 copies)
"The Near-Zero-Energy Home Makeover

Read: Plug in Hybrids, the Cars that Will Recharge America by Sherry Boschert



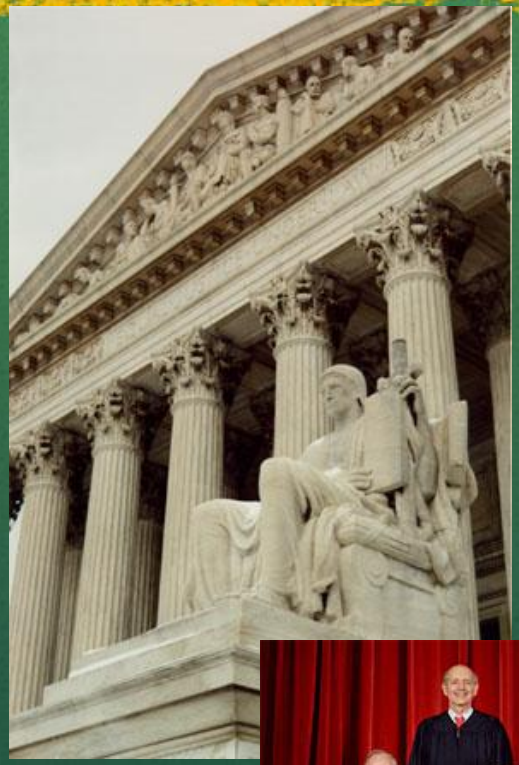
Students Engaged in CCSS, "Power of Zero" Writing Performance Task

American Government
U.S. History

. Student Learning Objective: **Students can identify, summarize the Court Decision in Massachusetts vs. EPA and assess the courts' ruling on the daily lives of Americans.**

Standard 12.5 Students summarize landmark U.S. Supreme Court interpretations of the Constitution and its amendments.

* 2003, Supreme Court Decision in Massachusetts vs. EPA: Clean Air Act authorizes EPA to regulate tailpipe emissions of greenhouse gases (which contribute to catastrophic



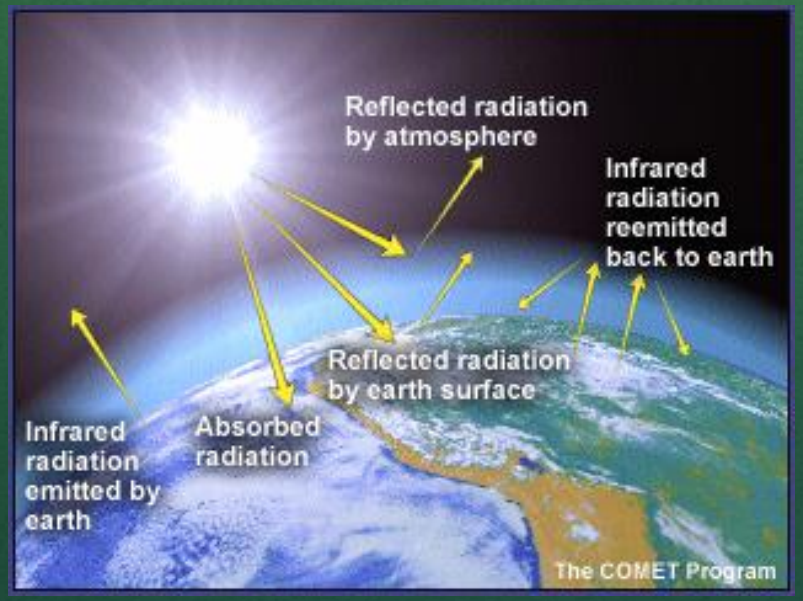
BIE: Scaffolding Activities

1. View zero emissions vehicle
2. Participate in zero waste “Goods Drive” for victims of Superstorm Sandy
3. Bake and enjoy solar baked cookies in zero energy solar oven

Power of Zero Summit @ Environmental Nature Center

Zero Summit: Environmental Nature Center

Learning about the Greenhouse Effect as related to Climate Change in a real greenhouse!



Power of Zero Summit: 3 workshops

↑ Bob Siebert, Sierra Club, Alex Gian

Stephanie Barger, **Earth Resource →**

↑ **Michael Winters, Climate Reality (trained by Al Gore)**

Zero Summit Displays: Zero Emissions Solar Ovens, E-bikes

Teacher John Alvarez plus E2TA student with Zero Emissions, electric bike

Solar Coach, Alex Gian with e-bike & 2 Zero Emissions solar ovens baking cookies

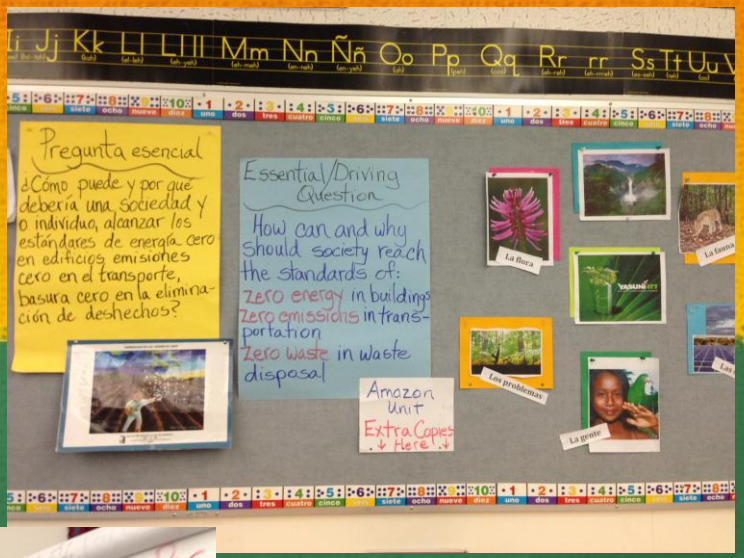
Zero Emissions Day: Planning Meeting

Students and Teachers planning District Wide “Zero Emissions Day, Bike, Walk to School Competition” with Partner School, Norwalk High

DISTRICT WIDE, Zero Emissions, Bike/Walk Day

- Earth Day Celebration, April 24th, 2013
- Compete for the most pounds of CO2 reduced on this day.
- District schools will participate
- Winning school, receives a "green" beautiful trophy, made from recycled glass, recycled wood
- School event organizer/teacher wins $300 for class supplies sponsored by CTA/IFT
- Event documents uploaded

Project Management Tips



↑ “Driving Question” poster with notebook of handouts for greater student independence.

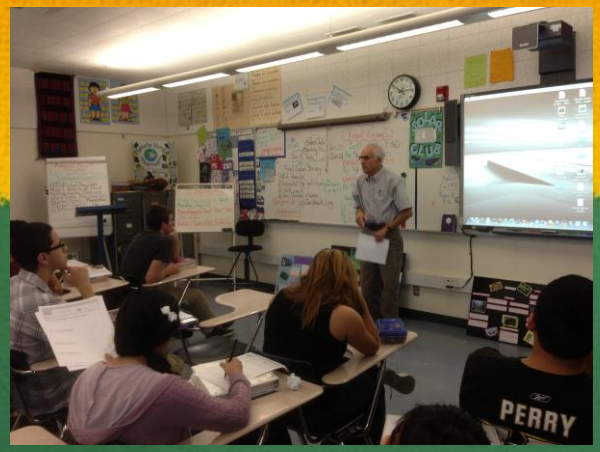
↑ Students working in teams of choice on projects of choice

←Students sign up for presentation date.

BIE: Outside Expert, Google Hangout

Katy Yan, International Rivers, Berkeley Office

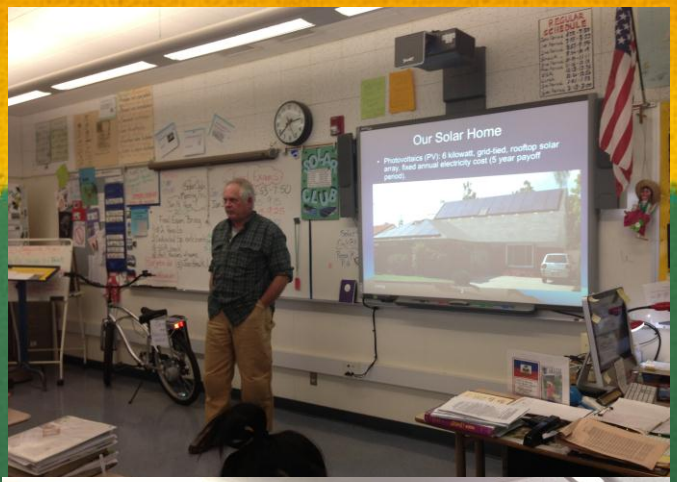
BIE: Guest Experts Give Feedback



⬆Expert Guest: EE Solar Company Founder, Bob Siebert, "Your research is

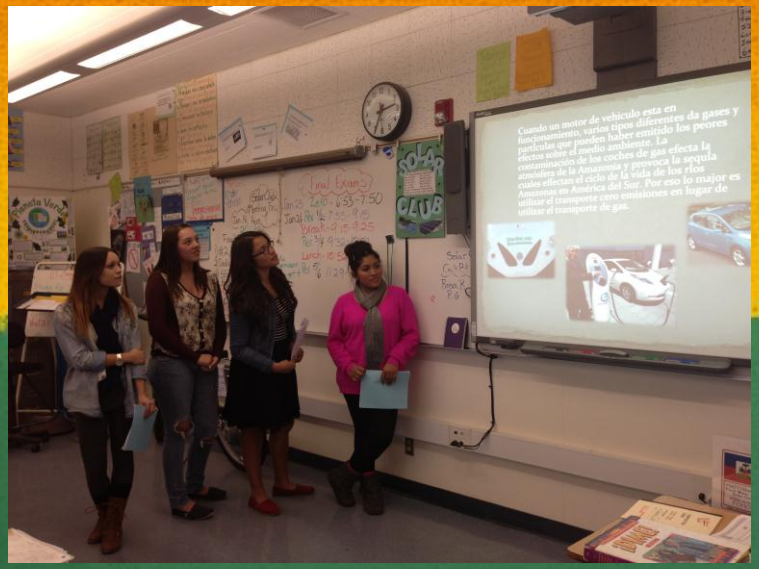
Expert Guest: GRID➔ Alternatives, Solar Installation, Supervisor, giving feedback on student presentation "Green energy industries are hiring".

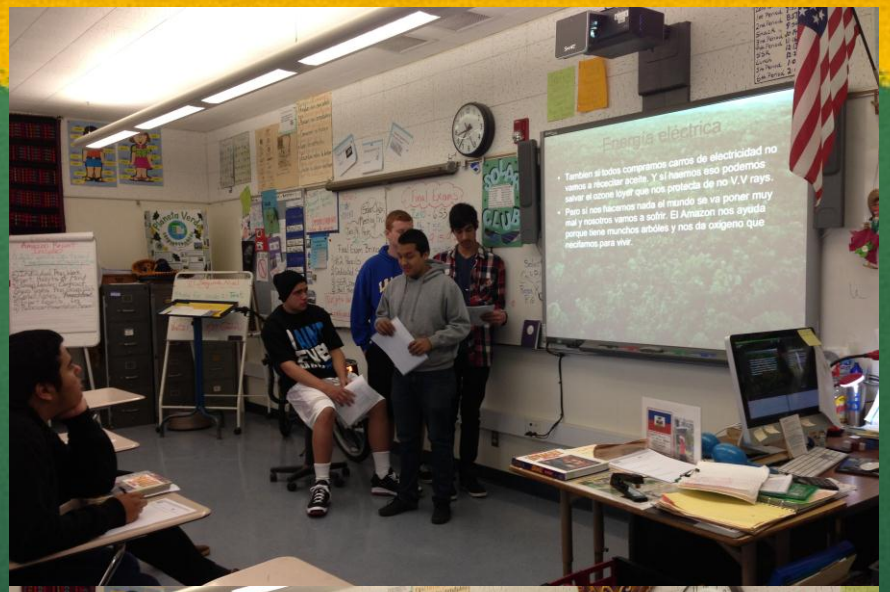
Solar Expert Guest and LMHS Principal, Bill ⬅Seals writing feedback comments to student presentations



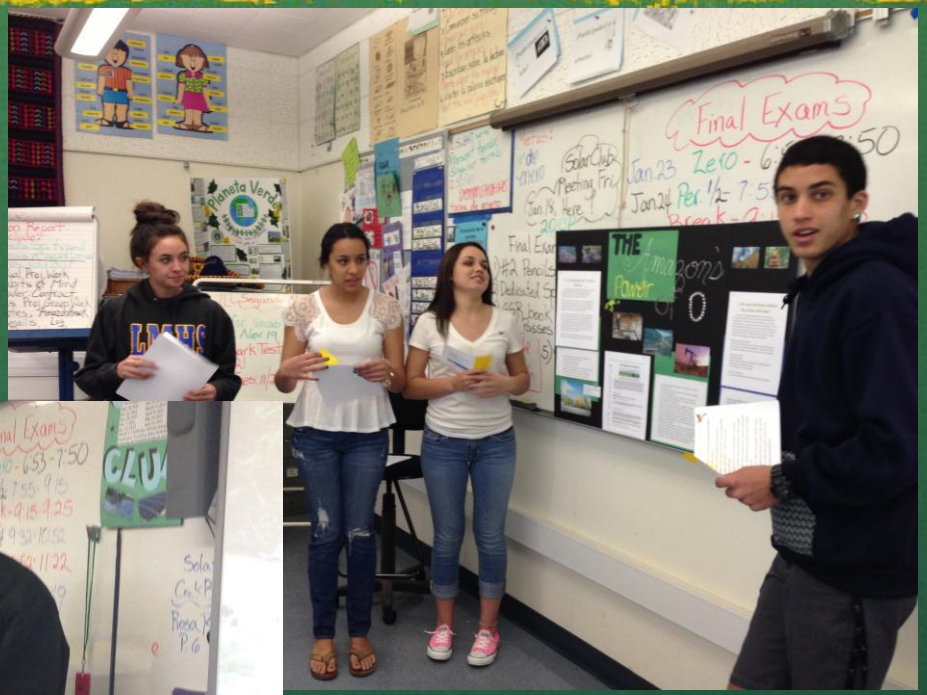
Science Teacher, Padmini⬆ Kishore listening to students present on rainforest solutions: "Good Job".

Presenting Culminating Products





More Presentations!



"Gotta Save The Amazon" Original Student Song

You Tube Video:
Gotta Save the Amazon
Google Hangout with Int'l Rivers

Habits of Mind, Student Comments

- Thomas - (Thinking Flexibly): "When I couldn't think of any lyrics to write for our song, I played hackey sack and I came up with our group project name 'Body by Pans". (Responding with Wonderment and Awe): "I approached this group project with a sense of gratitude and love for the Amazon".
- Alec – (Finding Humor): "You need to be able to find something humorous to lighten the mood; something I need to work on."
- Mayra – (Striving for Accuracy and Precision): "I told my group about the certain fact I know about zero waste but I wasn't completely sure. So I went online and looked it up. I was slightly correct."
- Student sample on display