



EVERY ACTION MATTERS

CLASSROOMS TAKE CHARGE

Service-Learning Lesson Plan

Project: Getting out the message of change to teachers and students at Madras High School

Author: Lilli Worona at Madras High School in Madras, OR

Project Overview: Students created a powerpoint and/or other media formats (e.g., video, interactive lesson plan, etc.) to present what they learned in environmental science classes to other classes in the school. Each group was responsible for researching 2-3 energy or carbon saving actions and then presenting about those actions to another class. This research included ways to get involved in the energy/ carbon saving action in our community as well as present data on how these actions can help facilitate action on a global scale. Presentations ended with presenters helping students in push-in classes get signed up for the Take Charge website.

Learning Objectives

- Compare and contrast how people around the world use carbon for transportation, food, housing and electricity.
- Trace energy associated with human lifestyles to its sources, particularly combustion of fossil fuels.
- Explain the consequences of lifestyle and energy system choices for changes in atmospheric CO₂ concentration.
- Suggest mitigation strategies for lowering carbon emissions.
- Identify forms of alternative energy and their implications for future reduction of carbon emissions.

Subject Areas: Environmental Science

Grade Levels: 10th, 11th, and 12th

Materials Needed:

- Computers, printing money for flyers

Key Partners:

- MHS teachers: 8 teachers participated in this event by allowing students to present their projects to their classes
- MHS administration: Administrators knew about this event and helped to coordinate times and days that would work best for push-in

Time Required to Complete Project:

- Teaching the curriculum took almost the entire semester. I left 3 weeks at the end to plan and facilitate projects.

How were the learning objectives evaluated?

Rubrics were developed for each facet of the project.

Service Objectives

The objectives were for students to practice public speaking and organizing their presentation into a format that makes sense for the audience. The students' goal was to educate other classes at MHS about the consequences of climate change and what they could do to help.

How were the service objectives evaluated?

Students used rubrics and evaluated each other. We had an in-class discussion on the effectiveness of the project and what we could do differently in the future.

Human Energy Systems Units Used (For lesson plans visit: carbontime.bsccs.org)

Activity 1.1 Human Energy Systems Unit Pretest

Activity 3.1 Millions of Flasks of Air

Activity 3.2 The CO₂ Trend: Your Ideas about the Keeling Curve

Activity 3.3 Why We Care About the Keeling Curve

Activity 4.1 Finding the Carbon

Activity 4.4 Zooming Into Fossil Fuels

Activity 4.5 Follow the Carbon

Activity 5.1 Carbon Emissions Jigsaw

Activity 5.3 The Upward Trend

Activity 6.1 How We Use Organic Carbon

Activity 6.2 Extreme Makeover: Lifestyle Edition

Activity 6.3 Secrets Revealed

Lessons & Activities (See below.)

- Human Energy Systems Part 2: Unit Organizer
- Service Learning Project Requirements
- Service Learning Project Proposal

Celebrating Student Accomplishments

We had an in-class party with refreshments and food!

Project Milestones

- Complete Systems and Scale Unit (Oct)
- Complete ecosystems unit (mid- Nov)
- Human energy systems part 1 with extra research on fossil fuels and the keeling curve (mid-Dec)
- Human energy systems part 2 (beginning of Jan)
- Human energy systems part 2 (beginning of Jan)
- Project outlines, flyers completed (mid Jan)
- Classroom push-in and project presentations (end of Jan)



Photo: Student explaining what carbon emissions are and where they come from to a Madras High School Geometry class.

Human Energy Systems Part 2: Unit Organizer

STANDARDS (I can...)

HS-LS-2-7

- Compare and contrast how people around the world use carbon for transportation, food, housing and electricity.
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VOCABULARY

Carbon Emissions • Climate Change • Fossil Fuels • Renewable Energy (solar, wind, hydroelectric, geothermal)

GRADED ASSESSMENTS	COMPLETION DATE	GRADE
Service Learning Proposal		
Communities Take Charge Outreach Flyer (P/F)		
Service Learning Presentation		

SCORING GUIDE

	F (0.0)	C (2.0)	B (3.0)	A (4.0)
Service Learning Proposal	<p>Proposal Questions: Missing or incomplete. Little effort producing a poor quality product. Does not demonstrate a minimal level of understanding.</p>	<p>Proposal Questions: All questions attempted, may lack detail and/or contain small errors. Shows a basic knowledge of the project requirements. Average quality product.</p>	<p>Proposal Questions: All questions answered, some extra details provided, few errors. Above average final product.</p>	<p>Proposal Questions: All questions answered in complete, informational sentences. Highly detailed answers with no errors. Exceptional final product.</p>
Communities Take Charge Outreach Flyer	<p>Fail: Flyer is missing or incomplete. Flyer is not electronically delivered to the teacher within 3 days of the due date.</p>			<p>Pass: Flyer is eye-catching (with relevant pictures, graphs, etc.) and includes a slogan to “hook” the audience. Flyer indicates how to access the communities take charge website and basic directions for how to sign up. Flyer is electronically delivered to teacher within 3 days of the due date.</p>

<p style="text-align: center;">Service Learning Project Presentation</p>	<p>Concept Understanding and Quality of Information: Project is incomplete or lacks sufficient information to convey the basic concepts outlined in the project requirements. Student does not distribute flyers or sign up audience for the communities take change website.</p>	<p>Concept Understanding and Quality of Information: The student demonstrates some confusion but understands the basic concepts required for the project (basic answers to each question outlined in the requirements) Student distributes flyers and tells audience to sign up for the communities take change website.</p>	<p>Concept Understanding and Quality of Information: The student demonstrates a solid understanding of the required project concepts (detailed power point slides responding to each question outlined in the requirements) Student distributes flyers and instructs audience on how to sign up for the communities take change website.</p>	<p>Concept Understanding and Quality of Information: The student demonstrates mastery of the required project concepts (detailed power point slides responding to each question outlined in the requirements plus A-level addition information). Student distributes flyers and aids audience in signing up for the communities take change website.</p>
	<p>Professionalism and Creativity: Project lacks neatness and is difficult to follow. Poorly created, showing obvious signs of rushing or lack of effort. Visual aids are absent or irrelevant. Project is not complete by the in-class presentation date.</p>	<p>Professionalism and Creativity: Project is moderately neat, but has three or more misspellings and/or grammatical errors. Project shows average effort and quality. There are only a few helpful visual aids in the presentation. Project may be a few days late, but is completed in time for in-class presentations.</p>	<p>Professionalism and Creativity: Project is moderately neat and has no more than two misspellings and/or grammatical errors. Project shows an above average level of effort and quality. Visuals are relevant and helpful for understanding the content of the presentation. Project is completed on time.</p>	<p>Professionalism and Creativity: Project is very neat. No misspellings or grammatical errors. Creativity is excellent and includes a wide array of visuals to supplement the presentation. Obvious, high quality effort is shown. Project is completed on time.</p>
	<p>Presentation demeanor: Presenters are difficult to hear and understand. Presenters make little eye contact and appear to be reading the presentation. Presenters appearance or gestures distract from the presentation. Only one member of the group does the presenting.</p>	<p>Presentation demeanor: Presenters can be heard and makes some eye contact with the audience. Presenters are appropriately dressed. Presenters presentation responsibilities may be unbalanced.</p>	<p>Presentation demeanor: Presenters speak clearly and loud enough to be heard. Presenters make eye contact frequently. Presenters are appropriately dressed and are somewhat engaging. Presenters share presentation responsibilities.</p>	<p>Presentation demeanor: Presenters speak clearly and use appropriate volume and pacing. Presenters maintain eye contact. Presenters are confident, enthusiastic and appropriately dressed. All presenters equally share presentation responsibilities.</p>
	<p>Presentation Length/Quality: Presentation is under 10 minutes in length or is excessively long and unfocused. Exhibition has no logical sequence and the focus is unclear.</p>	<p>Presentation Length/Quality: Presentation is 10-15 minutes long and has a clear introduction and conclusion.</p>	<p>Presentation Length/Quality: Presentation is 10-15 minutes long; exhibition is presented logically and with a clear focus.</p>	<p>Presentation Length/Quality: Presentation is 10-15 minutes long; exhibition is focused, logical and ideas are presented in a well-organized sequence.</p>

Names of Group members (3 max) _____

Class period _____

Date _____

Service Learning Project Requirements

Please use this guideline and the rubric below when planning your project presentations.

Due Dates:

My group's in-class practice presentation will be on: January _____.

My group's final presentation will be on January _____ in _____'s class.

1. Powerpoint presentation (10-15 minutes): Please see project proposal worksheet for requirements on what specifically should be on your powerpoint. The rubric on the back of this page should help you understand what your presentation should entail.
2. Flyer handout and explanation of the communities take charge website (3 minutes): Hand out your flyers and explain why we are participating in the program.
3. Class Sign up time (5 minutes): Instruct students on how to sign up for the communities take charge website. Students may use their cell phones or classroom computers to sign up. Please walk around the classroom and help students to sign up.

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Class period _____

Date _____

Service Learning Project Proposal

This project proposal is a way to outline your thoughts and goals before beginning work on your service learning project power-point and pamphlet. This proposal **is graded** (20% of your unit grade) so please make sure that it is detailed, accurate and complete. Below are questions that must be addressed on each slide of your Powerpoint. Answer questions in the manner in which you would like them to appear on your Powerpoint.

I. Background Information for your audience (slides 1-3)

What is climate change?

What are carbon emissions (CO₂ emissions) and where do they come from?

What processes cause an increase in CO₂ concentration in the atmosphere? (explain how carbon gets into the atmosphere through combustion and explain how carbon moves from pool to pool)

Why do carbon emissions effect climate change? (think keeling curve and the greenhouse effect!)

II. Explain why climate change is important and the impacts it is having on planet earth (slides 4-6)

What are some impacts of climate change on planet earth and earths systems? (There are dozens we have talked about in class. Choose 3 and give a little bit of background on each one how/why this is occurring)

Impact #1: _____

Background on why this is occurring:

Impact #2: _____

Background on why this is occurring:

Impact #3: _____

Background on why this is occurring:

III. What can we do as individuals to help reduce our carbon emissions? (slides 7-10)

Choose 3 “energy saving actions” from the carbon time website that you would like to present as personal solutions towards lowering carbon emissions. You must explain *how* each energy saving action lowers carbon emissions. (example: towel drying hair means less electricity use, means less fossil fuel is burned in a factory to create the electricity required to run a hair dryer)

Energy saving action #1: _____

How this energy saving action lowers carbon emissions:

Energy saving action #2: _____

How this energy saving action lowers carbon emissions:

Energy saving action #3: _____

How this energy saving action lowers carbon emissions:

IV. Extra Credit slides For A-level: Add 2-3 slides with additional information about curbing climate emissions. Some ideas are listed below, but do not limit yourself to this list, there are many possibilities.

Ideas:

- Include a slide about COP21 and what countries have agreed upon to curb their climate emissions
- Include a slide about alternative energy technology (wind, solar, geothermal, etc.)