

7.3 GREENING YOUR SCHOOL: SHADES OF GREEN

? FOCUS QUESTIONS:

- How can students become more environmentally conscious and conscientious?
- How can you lead your students in a project to “green” your school?

STANDARD #3 PEOPLE, PLACES AND ENVIRONMENTS.

STANDARD #8 SCIENCE, TECHNOLOGY AND SOCIETY.

LESSON OVERVIEW:

Based on successful environmental projects in schools in Heidelberg, Germany, this lesson provides the teacher with the steps to start a Green Club that will help students conceptualize the idea of sustainability and the broader issues dealing with the limitation of resources that is pervasive across the globe. This project stimulates an enthusiasm for public service by asking students, teachers, and administrators to think of innovative and creative ways to protect the environment. It will increase environmental awareness among students and challenge them to gain new perspectives on reducing, reusing, renewing, and upcycling waste. Is there a better way? What concrete changes or strategies could be taken by the school to join in the global effort to conserve resources and strive toward sustainability? Students will use their critical thinking and problem-solving skills. Their communication and collaboration skills will also be utilized as they present their ideas to the learning community. These students become change agents for their home and school communities. This environmental project will ultimately help the school community conserve resources. Students will learn to recognize an environmental problem, gain new perspectives, collect data, analyze the data, suggest innovative and creative solutions, take action, and report the results of their interdisciplinary project.

Service learning is encouraged frequently by state education department initiatives. Teachers may wish to contact their SED for more specific information.

(Note: Prior to the lessons, the lead teacher should be identified and care should be taken to be sure that key school administrators support the project. Whenever possible, outside experts should be sought to serve as mentors and guides for students. The lead teacher should ask teachers of other disciplines to participate in the project by including appropriate lessons in their classes. After the “club” is introduced, the actual meetings and functions of the club will be conducted after school.)



TEACHER BACKGROUND INFORMATION:

Germany is a leader in environmental conservation and is generally known for its efforts to reduce carbon and sulfur emissions, improve water purity, and increase conservation practices. A Heidelberg-based program exemplifies the country's commitment to educating the next generation in ways to green their schools and homes. Since the 1995/96 school year, the Office of Environmental Protection, Trade Supervision and Energy of the City of Heidelberg has implemented a project to save energy in schools, the so-called E-Team Project, in cooperation with students, teachers, administrators, and community members. Seventeen schools participate in the project. The topic of energy and climate protection has become firmly established in classrooms as part of the curriculum and interdisciplinary projects are being carried out. The key element of this school project is the energy saving teams, the so-called E-Teams, which are composed of pupils, teachers and the person in charge of energy (a school-based technician who communicates with local energy providers) and are supported by the school administration. The E-Teams analyze the energy consumption of the school, design energy saving programs and activities. Creative ideas are developed to make energy and water usage more efficient by means of behavioral and smaller technical improvements. At the same time, the E-Team project strengthens the students' sense of personal responsibilities as well as their communication and problem solving skills. In addition, the students continue their activities into the greater community of Heidelberg.

This lesson was inspired by the Heidelberg program. For additional information, please use:

It's Up to You and Me: Here and Across the Sea. <http://www.goethe.de/ins/us/lp/prj/top/mat/green/enindex.htm>

Climate Protection: We've done our homework! The E-Team Project (1999). City of Heidelberg, Office of Environmental Protection, Energy, and Health Protection. http://heidelberg.kivbf.de/servlet/PB/show/1124270/E-Team_GB.pdf

Background on the Heidelberg project: <http://www.display-campaign.org/example475.html>



TIME:



(1) 45 minute class period

1-2 semesters for project to be conducted

1-2 semesters for topic to be integrated into other disciplines

INSTRUCTIONAL RESOURCES:

- PowerPoint *Shades of Green* (**PowerPoint 7.3.1 on Instructional Resource Disc**)
- Vocabulary of Sustainability (**Handout 7.3.2 on Instructional Resource Disc**)

PROCEDURE:



- **Anticipatory Set:** The week before beginning this project the teacher should ask students, "What would we need to do to become a sustainable/zero waste school?" Then the teacher should ask students to use their cell phone cameras or digital cameras to take pictures of specific items in their school or home where the possibility of reducing, recycling, reusing, "up-cycling" (converting waste into new materials or products of higher quality) might be considered. What evidence of non-sustainability did they also observe? If possible, add student photos to the PowerPoint *Shades of Green* (**PowerPoint 7.3.1 on Instructional Resource Disc**) to present to the entire class.

DAY 1:

Two to three days after introducing the lesson using the anticipatory set and after students have had time to submit their pictures, show the PowerPoint, *Shades of Green*. The teacher should use the PowerPoint to stimulate class discussion and interest in creating an environmental or green club. During the slideshow, the teacher should provide time for class discussion, student involvement, and elaboration of the project. Talking points begin with Slide 9:

Steps: Who is needed?

- A lead teacher and supportive administration. (Both should be determined prior to the lessons).
- A Recording Committee that will document data. They will maintain a record of all aspects of the project in an easily retrievable format.
- Communication within the school to promote helpful and effective cooperation.
- Ask other disciplines to participate. This will work best as an interdisciplinary project. Including the project in a variety of subjects will help to ensure long-term action.

Interdisciplinary Lesson Suggestions

- **Social Studies:** The teacher will incorporate current events dealing with global warming and environmental terms to further student understanding of the topic. Students could write editorials or persuasive essays to promote the efforts of the Green Club. They could research the statistics regarding landfills and current waste management issues and create a Power-Point presentation to be shared in class or to a wider audience if possible.
- **Math:** Students could use electronic databases to create balance sheets to monitor heat, electricity, and water consumption. This will help determine the success of the green campaign.
- **Art:** Students could create visual reminders to help others remember to conserve energy. The signs could be printed on fabric to last longer. Students could create examples of upcycling products.
- **English:** Students could decide how to communicate to the school community what they have learned. During class they could write announcements, emails, skits, etc. They could maintain an energy information board to obtain feedback for ideas, suggestions, and criticism.
- **Science:** Students could research the various ways energy saving could take place. How can electricity be generated? Students could experiment with a variety of ways, e.g. by pedaling a bicycle. They could create demonstrations using solar energy for heating water. Science teachers could provide the scientific and technical support for the project by asking to borrow the technology used to measure electricity consumption, temperature, and light intensity from local energy-supply businesses. Perhaps a business leader would present a session teaching the students how to use the tools.

Steering Committee

- The club steering committee, lead teacher, administrator, and custodial team should take a tour of the building looking for the best approaches for saving energy. The steering committee reports to the club.
- Turn off lights when the room is empty. Can lights in the hall or other areas be lowered or turned off if not needed during a 5-minute break? How can natural light be utilized more? Can rooms be air-conditioned for a shorter time? Can leaks around windows and doors be sealed?
- Ask about the heating. Could the heat be turned on later and off earlier by a timer? Might there be a better configuration of room assignments to allow one area of the building to be heated at certain times and another not?
- Are there ways to cool the room without air conditioning? Can there be experiments to see what is most efficient?

Communication Committee

- The communication committee determines how to share the gathered information with the stakeholders, e.g., signs, email blasts, and announcements during the course of one to two semesters. Seeking publicity through school newspapers or local papers is recommended. At the end of the term the committee must determine how they will report their findings. Have the club's interventions been successful?

Recording Committee

- Collect and maintain all data gathered and present for future comparisons and reporting. Accurate data is necessary for reporting purposes throughout the school semester(s).
- Allow the students to divide themselves into groups representing one of the committees: steering, reporting, or communi-

cating. Allow time for each group to share what ideas they can offer. Have the group select a recorder to take notes that will be given to the actual committee members.

- Continue PowerPoint if time allows or show at the first club meeting.
- Announce to the class when the first club meeting will be held. During that meeting a name for the group may be determined.

MODIFICATION:

- Community volunteers may act as mentors for students who require more support.

EXTENSIONS:

- Teachers may invite outside speakers from local utility companies as well as local environmental agencies and organizations to share information with the students.
- Students may contact one of the schools in Heidelberg or other German communities and try to become “sister” schools in this endeavor. Perhaps the use of Skype and/or videoconferencing may be helpful.
- Students may create a PowerPoint comparing steps taken by Germany, other EU countries, and the US in environmental education and actions. This is in continuation of the examples shown at the end of the PowerPoint.
- Students may write, produce, and film a skit dealing with the theme of sustainability.
- The Green Club could present their findings to community members at the public library or a meeting of the municipal council.
- Students may research stand-by functions of the appliances they have in their own homes and write a report to present to the class.
- Students interested in endangered species may research the European Green Belt initiative. This addresses how areas along the Iron Curtain, specifically the former “death zone” in southernmost Germany, have been found to be a haven for wildlife. <http://www.europeangreenbelt.org>



Sources:

http://www.heidelberg.de/servlet/PB/menu/1101140_I2/index.html, retrieved August 2012.

(1999) *Climate Protection: We've done our homework! The E-Team Project*. City of Heidelberg, Office of Environmental Protection, Energy, and Health Protection. Retrieved August 2012: www.heidelberg.de/servlet/PB/show/1124270/E-Team_GB.pdf.

7.4 SIEMENS: LEADING THE WAY TOWARD A LOW CARBON ECONOMY

? FOCUS QUESTIONS:

- What is carbon sustainability? What part do humans play in the carbon cycle?
- How is the global community, specifically Germany, addressing carbon sustainability?
- What part are individual countries taking on to address this issue?
- How is sustainability addressed within the private sector?
- What choices can the individual make to further help carbon sustainability?

STANDARD #3 PEOPLE, PLACES AND ENVIRONMENTS.

STANDARD #7 PRODUCTION, DISTRIBUTION AND CONSUMPTION.

STANDARD #8 SCIENCE, TECHNOLOGY AND SOCIETY.

STANDARD #9 GLOBAL CONNECTIONS.

LESSON OVERVIEW:

This lesson focuses on understanding the carbon cycle and its impact on the global environment and economy. During the lesson students will engage in a variety of learning activities including focused reading, viewing, discussion, research and multi-media creation. The lesson is designed to incorporate cross-curricular learning opportunities by including common core learning targets across the contents. Additionally, the modular design of the lesson allows teachers to tailor the inquiry experience based on student population, specific district/state learning targets, and time constraints.

An option included within this lesson is a final project/portfolio in the form of a student-created website. The website project could be done individually, with a partner, or in a small group. The website would be a multi-media creation that would incorporate graphics, writing, and video. Over the course of the lesson, the website project is distributed into smaller assignments to be completed at the end of individual activities.

While the lesson activities include printable hand-outs and think sheets for students, these were created to be easily transferable into individual student notebooks or folders. Additionally, each video featured in the lesson includes viewing/discussion questions that could be used for notebook reflection. Using a notebook rather than handout

