



E-cycling for Environmental Justice

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INTRODUCTION

In this lesson, students will examine the problem of e-cycling (recycling electronics) and how it relates to environmental injustice in China where most of the waste is taken. They will then use legislation examples from states across the nation to write their own bill proposal for a federal law regulating e-cycling.

LESSON OVERVIEW

Grade Level and Subject: Grades 9-12; Social Studies, Civics; Environmental Science

Length: 1 – 2 class periods

Objectives:

After completing this lesson students will be able to:

- Understand what Environmental Justice is and how it relates to e-cycling in China
- Write their own bill proposal

National Standards Addressed:¹

- **Content Standard: [NS.9-12.6 PERSONAL AND SOCIAL PERSPECTIVES](#)**
As a result of activities in grades 9-12, all students should develop understanding of
 - Personal and community health
 - Population growth
 - Natural resources
 - Environmental quality
 - Natural and human-induced hazards
 - Science and technology in local, national, and global challenges
- **Content Standard: [NSS-C.9-12.3 PRINCIPLES OF DEMOCRACY](#)**
How Does the Government Established by the Constitution Embody the Purposes, Values, and Principles of American Democracy?
 - How are power and responsibility distributed, shared, and limited in the government established by the United States Constitution?
 - How is the national government organized and what does it do?
 - How are state and local governments organized and what do they do?
 - What is the place of law in the American constitutional system?
 - How does the American political system provide for choice and opportunities for participation?

¹ Education World (2008) *U.S. National Education Standards*. Retrieved April 6, 2009, from <http://www.education-world.com/standards/national/index.shtml>.

- **Content Standard:** [NSS-C.9-12.4 OTHER NATIONS AND WORLD AFFAIRS](#)
What is the Relationship of the United States to Other Nations and to World Affairs?
 - How is the world organized politically?
 - How do the domestic politics and constitutional principles of the United States affect its relations with the world?
 - How has the United States influenced other nations, and how have other nations influenced American politics and society?
- **Content Standard:** [NT.K-12.2 SOCIAL, ETHICAL AND HUMAN ISSUES](#)
 - Students understand the ethical, cultural, and societal issues related to technology.
 - Students practice responsible use of technology systems, information, and software.
 - Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Materials Needed:

- A sample electronic, such as a cell phone, calculator, or other small electronic device
- Pieces of Paper (can be scrap)
- Access to computers with internet
- Reproducible #1- **Regulating E-Cycling**

Assessment:

Students will be assessed through the following activities:

- Class participation and attentiveness
- Completion of **Reproducible #1- Regulating E-Cycling**

LESSON BACKGROUND

Relevant Vocabulary:

- **E-Cycling:** Recycling electronics to reduce waste and prevent pollution.
- **Environmental Justice:** “The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”²
- **Lead:** Toxic metal found in electronics that can be released when they are recycled and broken apart. Lead exposure can cause brain and behavioral damage, and is especially harmful to young children.
- **Mercury:** Natural element that can be toxic at high levels and can cause damage to the brain, kidney, lungs, and immune system; found in electronics and released when taking them apart.
- **Noxious Gases:** Gases that are harmful to human health.
- **Carcinogens:** Cancer-causing substances that are particularly harmful with high exposure.

Information:

²“Environmental Justice,” United States Environmental Protection Agency (2009). Retrieved April 6, 2009 from <http://www.epa.gov/environmentaljustice/index.html>

The statistics on e-waste in the United States are alarming. In 2005, the United States generated 2.63 million tons of e-waste. Of that 2.63 million tons, only 330,000 tons was recycled, the other 2,300,000 tons ended up in landfills and incinerators.³

Computers, cell phone and TV sets are the three main contributors to hazardous waste. With the introduction of newer, faster, and better computers, older models are quickly becoming obsolete. In 2006-2007, the Environmental Protection Agency (EPA) estimated that 157.3 million units of computer products (CPUs, monitors, notebooks, keyboards, mice, and hard copy peripherals) were trashed. Of these 157.3 million units of computer products, only 48.2 million units were recycled. By weight, the recycling rate is a mere 18%.⁴

E-waste poses significant hazards to both the environment and to humans. Electronics contain a multitude of toxins that can be harmful if the products are not properly managed at the end of their life. Electronic discards are responsible for about 40% of heavy metals in landfills.⁵

E-waste contributes to global warming in several ways. Improperly disposing of electronics rather than recycling means more greenhouse gasses emitted by landfills and incinerators. According to the EPA, "Landfills accounted for approximately 23% of total U.S. anthropogenic (human-caused) climate change."⁴ And on top of that, every item that is disposed of must be replaced which means additional emissions from manufacturing.

A majority of electronics are sent to third world countries to be dismembered for parts, where low-income residents spend their days being exposed to toxic and carcinogenic electronic waste. There is little regulation on the recycling of e-waste, and this makes it easy for companies to ship the parts around the world. It is important to recycle electronics, but legislation needs to be passed to control how and where it is done.

Resources:

- EPA guide to local e-cycling:
<http://www.epa.gov/osw/conserva/materials/ecycling/live.htm>
- Article on e-cycling injustice in China:
<http://www.usatoday.com/tech/news/2002/02/25/computer-waste.htm>
- How a Bill becomes a law: http://www.votesmart.org/resource_govt101_02.php
- How to write a Bill: <http://pmc.princeton.edu/writeabill.php>
- Information on Federalism: <http://plato.stanford.edu/entries/federalism/>

LESSON STEPS

Warm Up: *Introducing Environmental Justice*

³ Environmental Protection Agency. *Municipal Solid Waste in the United States: 2005 Facts and Figures*. Retrieved April 6, 2009, from <http://www.epa.gov/msw/pubs/mswchar05.pdf>

⁴ Environmental Protection Agency. *Statistics on the Management of Used and End-of-Life Electronics*. Retrieved April 6, 2009, from <http://www.epa.gov/epawaste/conserva/materials/ecycling/manage.htm>

⁵ Electronics TakeBack Coalition. *The Problem: Toxic Chemicals in Electronics*. Retrieved April 6, 2009, from http://www.computertakeback.com/the_problem/toxicchemicals.cfm

1. Start by introducing your class to the idea of environmental justice. Environmental justice mandates that every person has the basic right to live in a clean and safe environment. The Environmental Protection Agency's definition of environmental justice is "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."⁶
2. Environmental injustice occurs when communities are unfairly exposed to unhealthy toxins and pollution. Usually this occurs in poor communities where they do not have the resources to fight against it, and where land value is low. An example is a community that is located near a coal plant, landfill, or manufacturing plant.
3. Can your students think of any environmental justice issues in your community? These are especially common in low-income urban or rural areas. Think about sources of pollution, waste and degradation – is your area disproportionately affected by these? If not, where do you think these sources are? Discuss the reasons for this disparity.

Activity One: *The Life Cycle of an Electronic Device*

1. Before class begins, write each of the following words on a separate piece of paper: lead, mercury, greenhouse gases, water pollution, noxious gases, and cancer.
2. Split the class into two groups. One group will represent citizens in Guiyu, China and the other will be citizens of your hometown in the United States.
3. Hold up your sample electronic device and say that it represents all forms of electronics. Ask students where they think most of our electronics are built, in China or in the United States? (*Most manufacturing is in China, so the electronic device should be passed to the China group*).
4. Ask students to think of any environmental or health consequences that come from the manufacturing industry. Take the sign that says "greenhouse gases" and give it to the students in the China group, as they will be the ones most harmed by them.
5. Talk about where the electronic device goes once it is bought (*sent over to the United States*). Give it to the United States group.
6. Explain that the students in the U.S. group have tired of their electronic device, and they want to get rid of it, so they take it to an electronic recycling program so that it will not sit in a local landfill and pollute the air, ground and water. Although it may seem like the United States citizen is doing the correct thing, a large majority of e-cycled waste is shipped over to China to be disassembled for its valuable parts.
7. Give the electronic device back to China. Explain that in Guiyu, citizens earn a living by taking apart electronic devices, exposing themselves to toxic chemicals in the process, and degrading their environment. However, it is the only way that they can make a living, and so they must do it.

⁶ "Environmental Justice," United States Environmental Protection Agency (2009). Retrieved April 6, 2009 from <http://www.epa.gov/environmentaljustice/index.html>

8. Take the cards labeled lead, mercury, noxious gases, and water pollution to the China group. These all result from taking apart and burning electronic parts, so consequently citizens are exposed to toxic chemicals and do not have access to clean water.
9. Finally, hand the card labeled “cancer” to the students in the China group, as all of these toxic chemicals are carcinogens and can eventually cause cancer.
10. Have students take notice of how China received all of the pollution while the United States enjoyed the use of the electronic device.
11. Discuss how this example is a case of environmental injustice. *(The citizens of Guiyu live in a poor community and do not have the resources to fight against the pollution that they are experiencing. In fact, one of the few ways that they can make a living is through e-cycling, even if it is harmful to their health. Although these electronics are being used half a world away in the U.S., the U.S. citizens are not the ones who have to deal with the consequences of their disposal.)*

Activity Two: A First-hand Look at Environmental Injustice in Guiyu, China

1. Have students watch all or part of the video “E-Waste Dumping Ground” at http://www.cbc.ca/national/blog/video/environmentalscience/ewaste_dumping_ground.html *(Note: It may be easier for students to watch individually on a computer than as a group, as the video is small and cannot be enlarged. Additionally, it is about 18 minutes long, so you may want to preview the video and select certain segments or screenshots to focus on.)*
2. Discuss the video with students. Ask questions such as:
 - a) What amazed you the most about the video?
 - b) Why do you think that China receives our waste? *(A large profit can be made out of the parts in electronic devices.)*
 - c) Why do you think the people in the video participate in recycling electronics even though they know it is unsafe and illegal? *(It is a better form of living than farming is, which is their traditional form of employment. It guarantees them a job and a steady income.)*
 - d) What examples of environmental injustice did you notice in the video? *(Polluted water, exposure to toxic chemicals, air pollution, increased health problems, visual pollution, etc.)*
 - e) Do you think it is fair that China receives our waste and the pollution that results from it?
 - f) What are some ways that you can help the problem? *(Buy less and use products longer, donate items, investigate e-cycling companies before you use them, write to your legislator to demand regulation on e-cycling).*
 - g) Are there any other reactions/questions anybody wants to share?

Activity Three: Creating Solutions: Writing a Bill Proposal

1. Discuss the idea of Federalism with students, explaining how state governments have their own rights separate of the federal government, and this means that the right to govern citizens is shared between the two bodies. Focus on the idea that States can be a testing ground for policies before the Federal Government decides to enact them.
2. Explain that many individual states have varying legislation and regulation on e-cycling; however there is not any federal regulation or legislation on the topic. By looking at the

ways in which states have addressed the issue, the federal government can use these examples to create legislation of their own.

3. Pass out **Reproducible #1- Regulating E-Cycling to students**. Have them complete the assignment either during class or at home.

Wrap Up: *Discussing Legislation*

1. Have students share the legislation they wrote with other students. This could be in small groups or as an entire class. Have them compare what they wrote with others. Have them discuss the following:
 - a) What did you include in your bill and why do you think it will create a solution to the e-cycling problem?
 - b) What state legislation influenced your decision? Why did you think this was the best example?
 - c) Do you think this will help solve the environmental injustice problem in China? If so, how?
 - d) Do you have any other ideas for solutions to the problem?

Extension: *Investigating E-cycling*

Have students investigate e-cycling in their local area and state. Do they have legislation for regulating it? Look into companies that claim to be e-cycling - where do they send the products once they drop them off? If you find an e-cycling company nearby that recycles electronics in an ethical manner, arrange an e-cycling drive at your school. Otherwise, try organizing a donation drive and give the old electronics that are donated to a charity that can redistribute them to those who need them.

CONCLUSION

By using Guiyu, China as an example, students learned about e-cycling and its connections to environmental justice. They also reflected on the role of federalism in our government, and wrote their own legislation with suggestions on how to regulate e-cycling.

Regulating E-Cycling

Now that you have learned about e-cycling and the environmental injustice it causes in China and other areas, your assignment is to construct a bill proposal that will regulate e-cycling in the United States.

Start by visiting this website to view the legislation of states that have already enacted e-cycling regulation laws: <http://www.ecyclingresource.org/ContentPage.aspx?Pageid=28&ParentID=0>. Consider the pros and cons of the various legislations, and which state you think has the most efficient policies. Use the information and ideas for inspiration when writing your own bill.

To begin writing your bill, think of the goal that you want it to accomplish. Write your goal here:

Once you have a set goal, use the template below from the Princeton Model Congress at Princeton University to format your bill. (View their website, <http://pmc.princeton.edu/writeabill.php>, for example bills and additional information). You will need to include a preamble, body, and enactment clause as a part of your proposed legislation. The preamble will be an introduction to the issue and a description of the problem, the body will describe how that problem should be solved, and the enactment clause will give a deadline for when it needs to be done. Your final product should be instructions on how to reach your goal.

Name _____

Title of your bill:

Body: Sections, subsections

Enactment Clause: Deadline