LESSON PLANS and FACILITATOR'S NOTES

MODULE 1

MODULE 1 LESSON PLAN

NOTE: The Module 1 Facilitator's Notes following this lesson plan provides detailed instructions, a suggested script and additional resources.

Module: 1
Length of time: 2 hours (1 hour instruction 1 hour activity)

Your Environment: Past, Present and Future

Materials and Resources Needed:

- Flip chart or board
- Markers
- Excerpt of Clive Ponting's book *A Green History of the World*
- Excerpt of the Industrial Revolution
- Pictures, articles and stories of Easter Island, The Lorax, Love Canal, Cuyahoga River Fires, Woburn, Pollution
- Computer with CD-ROM and projector or TV w/ DVD Player

Learning Objectives:

1. Students will be able to explain why taking care of the environment is important.
2. Students will be able to identify how they can make a difference to improve the environment.
3. Students will be able to describe an environmental problem from the past and present and discuss a future environmental opportunity.

Procedures:

SEGMENT 1

1. Get the attention of the students. Pose the question "What does the environment mean to you?" to the entire class. Collect answers from the students and write on the board or flip chart for all participants to see. (3 minutes)

2. Introduce the curriculum to the students. Review very briefly the four modules that they are going to be exposed to throughout the days to come. Don't forget to tell them that they will also be participating in one hour of activity related to this module later in the day or in evening programming. (2 minutes)

    a. *Your Environment: Past, Present and Future*
    b. *You and the Environment: Home, Center and Community*
    c. *You and the Changing Climate*
    d. *You in the Workforce: Making Your Job Green*

3. Begin the first module, *Your Environment: Past, Present and Future*.

4. Start by telling the students the information that you learned from reading the story about Easter Island. Emphasize that like Easter Island, the earth has only a limited

number of resources to support the demands of a human society. The island inhabitants consumed all natural resources and cut down all of the trees and therefore unable to make boats to vacate the island ultimately resulting in a barbaric society. (5 minutes)

5. After reviewing the story of Easter Island, begin a discussion with the group with the topic of "Why is it important to take care of the environment?" (5 minutes) ***NOTE: The story "The Lorax" can be used as a substitute for Easter Island.***

SEGMENT 2

6. Review the terminology the students are going to encounter in this module. (2 minutes)
7. Transition into the Industrial Revolution. What do you think of when I say "Industrial Revolution?" Briefly discuss what the Industrial Revolution was and how it affected the environment. (3 minutes)
8. Some people had such little regard for the environment that they would dispose of toxic/flammable chemical into rivers and streams. These practices resulted in environmental disasters such as the Cuyahoga River Fires. Show the students a video clip of the Cuyahoga River on fire. Share the brief story of the river fires with the students. (10 minutes)
9. Briefly share stories about the past and present with the students that describe the additional environmental issues and disasters such as those listed below. Show pictures or articles if available.
    a. Love Canal – Past
    b. Woburn – Past and Local
    c. Charles River – Before /After Local
    d. Mercury in Fish – Present
    e. DDT – Pesticides – Past/Present
    f. Air Pollution – Present
    g. Hazardous Waste – Present
    h. Plastics in the Ocean – Present
    i. Any local issues either in the past or present can be incorporated as well

SEGMENT 3

10. Show pictures of Love Canal (Black Creek Village) and the Cuyahoga today. Describe the changes. Briefly discuss the government's role.

11. Ongoing, current Environmental issues can be discussed here, such as:

    - Clear Cutting and the loss of biodiversity: Destruction of rain forests.
    - Depletion of fishing stock.
    - Climate Change: Melting ice caps severe and irregular weather patters, spread of insects, and loss of infrastructure – cities under water.
    - Water Pollution: Dead Zone in the Gulf of Mexico.

12. Now that we have discussed environmental disasters, ask the students "Can you think of things that are happening today to prevent environmental issues?" and "What else can we do now to help our environment in the future?" List the students' responses on the board or flip chart. (5 minutes)

SEGMENT 4

13. Summarize this lesson by reviewing the objectives to ensure that students understand the topics and information covered. (15 minutes)

    a. Can the students explain why it is important to take care of the environment?
    b. Can students identify how they can make a difference to improve the environment?
    c. Can the students describe the history of the environment – past, present and future?

Terminology:

- **Carbon Footprint -** The total amount of greenhouse gases produced to directly and indirectly support human activities, usually expressed in equivalent tons of carbon dioxide (CO_2).
- **Clear Cutting** – A section of forest where all trees have been cut down and harvested.
- **DDT** (dichlorodiphenyltrichloroethane) – Synthetic chemical pesticide with a controversial history. DDT is known to have had adverse effects on humans, animals and the environment. Rachel Carson's books, Silent Spring, published in 1962, lead to most uses of this product to be banned in the U.S. in 1972.
- **Environment** – The totality of surrounding conditions, including the air, water, and fertile land, that allow life to thrive.
- **Green** – Term used to refer to services, products, and practices whose manufacturing purchase and use allows of economic development while still promoting conservations for future generations.
- **Industrial Revolution** – The Industrial Revolution was a period from the 18th to the early 19th century where technological discoveries resulted in major changes in agriculture, manufacturing, mining, and transport. In addition to creating a greater variety and volume of products and services, the Industrial Revolution has increased the pace and intensity of natural resource consumption and contamination.

- **Mercury** –Toxic chemical element, often found in fish.
- **Natural Resources** – Materials that occur naturally within environments that exist relatively undisturbed by mankind, in a natural form. Natural resources are derived from the environment. Many of them are essential for our survival while others are used for satisfying our wants. Natural resources may be further classified in different ways.
- **Renewable Energy –** Energy generated from natural resources - such as sunlight, wind, rain, tides, and geothermal heat - which are naturally replenished.
- **Sustainability** – Ability to endure, maintain and continue over a long period of time.

Required Discussion Topics:

1. What does the environment mean to you?
2. Why is it important to take care of the environment?
3. Easter Island (or "The Lorax")
4. The environment – Past, Present and Future
5. Industrial Revolution
6. What are some things that we can now to help our environment in the future?

Suggested Activities:

To be done for the second hour of this lesson; can also supplement the curriculum and be done during structured evening programming or on the weekends.

Please note that there is one required activity for this module: Carbon Footprint – Students discover their own personal impact on the environment by calculating their personal carbon footprint.

- **Movies** – Show movies that have a direct correlation to the environment and or environmental disasters (e.g., *Erin Brockovich*, *A Civil Action*).
- **Adopt-A-Highway** – Weekly participation in collecting the trash and beautifying the stretch of highway of which is adopted. Centers can also track the amount of trash in weight collected and connect how much money people are literally "throwing out the window" (by way of returnable cans and bottles) and deposit into Student Government Association account.
- **Waste Audit** – A study of how much waste is actually accumulated on and by the center (e.g., cafeteria, paper, electricity, etc).
- **Island Activity** – Role play how to manage resources toward sustainability.
- **50 Simple Things You Can Do To Save The Earth** – Consult the book to determine which type of activity the class would like to participate in to "save the earth."

Informal Assessment Options:

1. Crossword Puzzle
2. Word Search

Academic Concepts:

- Reading
- Critical Thinking

Career Success Standards Correlation:
⌗ Personal Growth and Development ⌗ Workplace Relationships and Ethics ⌗ Communications ⌗ Information Management ⌗ Independent Living Skills ⌗ Multicultural Awareness ⌗ Career and Personal Planning ⌗ Interpersonal Skills

MODULE 1 FACILITATOR'S NOTES

Objectives

1. Introduce students to the concept of environmentalism and lead a discussion on what they think of when they hear the term.
2. Describe various incidents from the past that illustrate what can happen when environment matters are ignored (Easter Island, Love Canal, Cuyahoga River, etc.).
3. Explain what was done as a result of those incidents and how we are better off today because of it.
4. Discuss with students the issues we are still facing today and the associated dangers.
5. Brainstorm with students for different ways that each person can help to make a difference using *50 Simple Things you can do to Save the Earth.*

Suggested Script

Course Introduction

ACTION	NARRATION
Discuss what the environment means to the students.	What comes to your mind when you hear the word "environment"? And "what does the environment mean to you?" ***<Record answers on white board.>***
Introduce the course and explain the course goals.	Our environment should be important to all of us. This course will introduce environmental concepts and issues and how it applies to you. Focus will be placed on why it is important to protect the environment, what we can all do on an individual, center and community level, as well as how being "green" relates to employability. It will be a pre-cursor for many of you since several of our CTT offerings have "Green TARs." But even for those of you who don't have specific TARs, we'll talk about how being a "green" citizen can be brought into the workplace to help you, your employer and the environment. This course is divided into four modules; "Your Environment: Past, Present and Future," "You and the Environment," "You and a Changing Climate," and "You in the Green Workforce." Each module will have about one hour of classroom discussion, as well as a one hour activity to do on your own or in groups. Today we are going to look at a few things that happened in the past and that are happening currently that led us to realize why it's so important that we pay attention to the environment to protect our future.
Review module terminology	There are lots of important terms that we'll be using in this course, as well as in many of your CTT courses. Let's take a few minutes to review them to make sure we're all on the same page: ***<Consult the terminology found at the end of Module 1 Lesson Plan.>*** • Clear Cutting • DDT • Green

	• Industrial Revolution • Natural Resources • Renewable Resources • Non-renewable resources • Fossil Fuels • Sustainability
Environment and the Past	
ACTION	**NARRATION**
Show slides or photographs of Easter Island and read a brief passage of Clive Ponting's "*A Green History of the World*."  **Lead class discussion about the segment.** 	***<Describe the history of Easter Island; NOTE: May substitute with "The Lorax">*** Easer Island is a small example of how resources have to be managed responsibly in order for a society to survive. Many of the resources they had available to them – trees, chickens, crops - were all renewable resources, meaning they could be replaced, if managed correctly. More trees and crops could be grown and more chickens bred. • Why did the Islanders run out of these things? • Could they have avoided what happened? • Do you think that something like this could happen today? • How about in the United States? Although Easter Island is a small, isolated island, it is not much different than the US. We are on a much larger island, but the risk to run out of trees, crops, water or other resources is the same. The lessons learned from Easter Island can be applied to our lives. We are tied to our environment and we must take care of it, or it will not be able to support us. From the history of Easter Island, we learned that we must pay attention to our resources and learn how to conserve them. In fact, a lot of what we do today comes from lessons we learned from past mistakes. The Industrial Revolution of the early 1900's sparked the production of many more goods, creating more demands on our resources, along with creating large amounts of waste and chemical by-products. The Industrial Revolution of the 1800's transformed the world in incredible ways, taking a global economy powered by people, animals, wind and water, and applying pivotal technological inventions to make it a thousand times more productive and dynamic. Throughout the 18th and 19th centuries, advances in steam power, textiles, mining, metallurgy, chemical production, machine tools, and gas lighting allowed for further developments in transportation, manufacturing, and agriculture. The Industrial Revolution dramatically

	increased the availability and variety of products and services and greatly accelerated the pace and intensity of natural resource consumption and contamination. This includes the use of fossil fuels, minerals, timber, and agricultural products. The environmental impacts of the Industrial Revolution were clear from the beginning. As with today, polluted air and water were a cause for great civic concern. In the United States, the continued growth of industrial production resulted in a string of environmental catastrophes in the 1960s, 70s and 80s that horrified the public and caused Congress to enact environmental laws. ***<Here are some examples that the instructor can use regarding environmental problems of the past.>*** **Water Pollution**: There are many accounts of multi-color rivers, running yellow, blue, green and orange through mill towns and cities rivers across America. The rivers were being polluted by dyes and vibrant waste effluents from manufacturers of shoes, textiles, and chemicals. But the story that most captured the most national media attention was in 1969 when Cleveland's Cuyahoga River caught on fire. Although the flames arose from an oil slick and floating debris, the burning river became a powerful symbol of a planet in disrepair. Congress passed the Clean Water Act to limit the amount and type of water pollution discharged by industry, mainly by requiring wastewater treatment systems.
Show pictures of the Cuyahoga River burning. **Lead a discussion about the causes and consequences.**	http://www.ohiohistorycentral.org/entry.php?rec=1642 **Air Pollution**: The devastating black smog that blanketed the town of Donora, PA for several days in 1948 and other historical black smog in Liege, London, and Los Angeles. EPA created the Clean Air Act to curtail the amount of air pollution emitted by industry. To do this, manufacturers installed traps on their smoke stacks to capture contaminants. Currently, China suffers from intense levels of air pollution that once plagued US cities. http://www.nytimes.com/2007/08/26/world/asia/26china.html **Hazardous Waste**: The environmental disaster of Love Canal alerted the nation to the invisible health risks associated with the land disposal of hazardous waste. Lois Gibbs, a young housewife affected by the contamination, became a national environmental hero for grassroots activism. Congress passed the Resource Conservation and Recovery Act (RCRA) requiring hazardous waste generators to track their waste from "cradle to grave" and to approve of disposal facilities.

Show pictures of the Love Canal.	**Industrial Explosions and Toxic Releases**: On December 3, 1984, an industrial explosion released more than 40 tons of a deadly gas from a pesticide plant in Bhopal, India, immediately killing at least 3,800 people and causing significant morbidity and premature death for many thousands more. Congress passed the Emergency Planning and Community Right-to-Know Act (EPCRA) to help communities plan for emergencies involving hazardous substances. Today, every community plans for emergency responses to large industrial accidents, like explosions and releases of hazardous chemicals. In the case of Love Canal, toxic waste was buried underground and forgotten about – out of sight, out of mind. Later, when a new community developed on top of the waste, they didn't realize that it would be a problem, as a result many people got sick and families suffered. ***<Time and resources pending, share local stories about the past and present.>***
The Environment Today	
ACTION	**NARRATION**
Show pictures of Love Canal (Black Creek Village) and the Cuyahoga TODAY. Describe all of the changes. **Discuss the progress that has been made.**	Because of issues like these, laws were put in place to regulate businesses and their waste. Laws and regulations have been developed largely as a reaction to events like these to prevent them from happening again. No longer are businesses and manufacturers allowed to dump or bury their waste. Agencies like the Environmental Protection Agency are monitoring businesses and enforcing the regulations. Here's an example: Rachel Carson's book "Silent Spring" helped to spark an environmental movement in the 1960's. In it, she documented how the use of DDT had lead to the deaths of hundreds of people, countless plants, animals, birds (including the Bald Eagle) and lead to massive damage to the environment. DDT was so commonly used that children ran behind the pesticide trucks and played in the chemical fog that they were spraying out. Once the dangers were publicly realized, not only did the government stop the production and use of the chemical, but people woke up to the fact that our actions have very broad, very significant effects on the world. It was the beginning of people looking at their behaviors and seeking ways to help their environment. As you can see from these examples, progress has been made. What other examples of progress can you think of? ***<Solicit student discussion.>***
The Environment in the Future	
	Progress has been made, but things are changing even more today. People are starting to look ahead to problems that may be developing and for things we can do to prevent more catastrophes from happening. People are also seeing that there are things that can be done on an *individual*

Discuss where we stand now and track the suggestion on a flip chart *(to be used as a reference in Module 2)* **Explain that these will be used and built upon throughout the course.**	level to help protect the environment, and ourselves. ***<Solicit student discussion.>*** • Can you think of any Environmental Issues that are well known today? • What Issues are we trying to prevent? • What are some of the things that we can do now to help our environment in the future? ***<Be sure to discuss topics such as Alternative Fuels, Renewable Energy and Green Buildings are covered; explain if needed.>*** • How much of an impact do you think just one person can have? Why should each one of us do our best to protect the environment?

One Hour Activity

Each module should be preceded with an activity, approximately one hour in length. This may be conducted after the lesson, during structured evening programming or on the weekends. Below is a list of activities and resources from which to choose.

Please note: This module has one <u>required activity</u> for students, a completion and review of each student's Carbon Footprint. This should take approximately 20 minutes:

- ***Carbon Footprint –****Visit websites to determine students' carbon footprints. Results can be brought to class and discussed in Module 2, along with ways they could reduce their footprint*
  - *http://www.earthteam.net/action_month/images/DriveNeutral%20Total%20Emissions%20Calculator%20-%20SchoolNeutral%200.92b.xls*
  - *http://www.earthlab.com/*
  - *http://www.climatecrisis.net/takeaction/carboncalculator/#*

Additional suggested activities:

- ***Movies*** *- Erin Brokovich; Rachel Carson's Silent Spring (PBS/WGBH); A Civil Action*
- ***Adopt-A-Highway –*** *Adopt a highway and collect trash to be brought back to the center and weighed/measured*
  - *http://www.adoptahighway.com/*
- ***Pick an activity from "50 Simple Things You Can Do to Save the Earth" book***
- ***Waste Audit*** *– Conduct a center-wide study of how much waste is actually accumulated on and by the center (e.g., cafeteria, paper, electricity etc.)*
- ***Island Activity*** *– Role play on how to manage resources to become sustainable*

MODULE 1 ADDITIONAL RESOURCES:

SECTION	RESOURCE
THE ENVIRONMENT IN THE PAST	• **Easter Island history:** o Read prior to class to describe our dependence on the environment and what can happen if we do not manage our resources: http://www.primitivism.com/easter-island.htm • **Industrial Revolution:** o http://library.thinkquest.org/4132/info.htm • **History of Love Canal:** o http://www.damninteresting.com/the-tragedy-of-the-love-canal# o http://www.epa.gov/history/topics/lovecanal/01.htm • **History of the Cuyahuga River fire:** o http://www.ohiohistorycentral.org/entry.php?rec=1642 o http://environment.about.com/b/2009/06/22/1969-cuyahoga-river-fire-sparked-new-efforts-to-protect-the-environment.htm o Cuyahoga River today – an article with video of river's history and present condition – written in 2009, the 40th anniversary of the fire: http://www.cleveland.com/science/index.ssf/2009/06/cuyahoga_river_fire_40_years_a.html
THE ENVIRONMENT IN THE PRESENT	• **School carbon footprint calculator** o http://www.earthteam.net/action_month/images/DriveNeutral%20Total%20Emissions%20Calculator%20-%20SchoolNeutral%200.92b.xls
THE ENVIRONMENT IN THE FUTURE	• **Green Team lessons and activities** o http://www.thegreenteam.org/kit.html • **Individual Carbon Footprint calculator** o http://www.earthlab.com/ o *http://www.climatecrisis.net/takeaction/carboncalculator/#*