

JOB CORPS

Green Jobs

Integrating Career Technical
Training Into the “Green” Economy



United States Department of Agriculture • Forest Service

CURRICULUM AND ACTIVITY GUIDE—MODULE 3

“Since new developments are the products of a creative mind, we must therefore stimulate and encourage that type of mind in every way possible.”

—George Washington Carver, American scientist, botanist



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PURPOSE OF THE MODULE

The lessons that follow are designed to introduce Job Corps students to the concepts of both the “green” economy and how developing “green” skills can benefit them in the workplace, both in increased wages and long-term career advancement. Green-collar jobs are blue-collar jobs that have been created or adapted to help protect or improve the environment. In the Job Corps, “green-collar jobs” and “green jobs” will be used interchangeably. The vocational trades offered by Job Corps can be easily modified to integrate green skills. The vast majority of “green-collar” jobs are being created in renewable energy, energy efficiency, and resource conservation. These “green-collar” jobs better protect the environment and can provide career-track employment opportunities in environmentally friendly fields. Examples include electricians who install solar panels; plumbers who install solar water heaters; chefs who use organic, locally produced food; and construction workers who build energy-efficient green buildings. These jobs help restore the environment, improve energy efficiency, and conserve natural resources.

Our Nation’s future relies on a well-educated public to be wise stewards of the very environment that sustains us, our families and communities, and future generations. Teaching young people about the environment will help them, as they prepare for the working world, to make the connections between economic prosperity, benefits to society, environmental health, and our own well-being. Ultimately, the collective wisdom of our citizens, gained through education, will be the most compelling and most successful strategy for environmental management.

At the same time, business leaders increasingly believe that an environmentally literate workforce is critical to their long-term success and profitability. With better environmental practices and improved efficiencies impacting the bottom line, businesses

will prepare their companies for the future. Charles O. Holliday, Jr., Chairman and Chief Executive Officer of DuPont, speaks for a growing number of his peers in declaring that “an environmentally sustainable business is just good business, given the growing concern for environmental problems across America. A key component of an environmentally sustainable business is a highly educated workforce, particularly involving environmental principles.”

INTRODUCTION

When there is an environmental emergency or an economic crisis, low-income families are often the hardest hit. The economic collapse has left low-income communities particularly vulnerable to high unemployment and rising living costs. These populations also suffer disproportionately from the environmental and public health impacts of climate change, and they often live in neighborhoods where industrial pollution poses a health threat. A new, green economy promises the opportunity to fight climate change, while simultaneously revitalizing communities that, now more than ever, are struggling from decades of economic and environmental neglect.

Green-collar jobs can be a way out of poverty by giving students valuable skills that will earn them increased wages. Job Corps prepares students for stable, long-term careers that provide a living wage and are also good for the environment. While at Job Corps, students should strive to develop skills and knowledge in green jobs so that they are well prepared for the future and have an advantage in the workforce.

REFERENCES

Green the Block. <http://www.greentheblock.net>.
Green For All. <http://www.greenforall.org>.

CONNECTING TO THE CONTENT

Why should students consider green jobs?

1. **Green jobs may pay up to 20 percent more than other jobs.** As we transform America to a new green economy, green-collar workers will be in demand. Many companies are paying higher wages to workers with green-collar skills. Green-collar jobs provide living wages and allow everyone to share in the benefits of the middle class. Check out <http://earth911.com/blog/2009/10/19/what-are-the-hottest-green-jobs/> for more information on the earning potential in green-collar jobs.
2. **Green jobs are and will continue to be plentiful.** Consider a State that, for example, creates legislation requiring houses to improve in energy efficiency. This legislation may mean that windows need to be replaced, heating and cooling systems upgraded, alternative technologies installed, and energy efficient appliances considered. Now, think of all the houses in one State alone. Do you think there are enough workers in that State to get this job done? In most cases, there are not enough trained workers. There will continue to be opportunities in green-collar jobs as we transition to a new green economy. Green-collar businesses continue to grow and hire staff despite the economic downturn.
3. **Green jobs are not just for scientists.** Green jobs are for everyone! The green economy needs salespeople, installers, carpenters, technicians, cooks, tree planters, and people in traditional blue-collar jobs that have green-collar skills. Many green-collar jobs require more education than high school, but less than a college degree. Job Corps centers are a great location to develop the training and skills needed for green-collar jobs.
4. **Becoming trained in a green-collar vocation provides advantages over those people who are already in the workforce.** Employers look for skills and experience. Students may be concerned that they won't have enough work experience to get a job once they graduate. However, green skills may put them at the top of the list over someone with more experience.
5. **Green jobs are often found close to home.** Wouldn't it be great to have a job in your own community? Cities, counties, and businesses are looking for local workers to plant community gardens, install solar panels, and weatherize homes. It is very expensive to bring in these workers from other locations and, in most cases, this work can't be shipped elsewhere.
6. **Green jobs help to protect and improve our environment.** The human population is currently using up the Earth's resources at a faster rate than they can be produced. We are digging up coal and pumping oil that pollute the planet, result in a rapidly changing climate, and create health problems for people and animals. We need to find ways of supporting ourselves and protecting the planet at the same time. People who work in green-collar jobs are making homes more energy efficient and are planting urban trees to absorb carbon dioxide.

Find out more about green jobs. Check out <http://www.greentheblock.net> and find out what is happening with green-collar jobs in Brooklyn, NY, and watch the video entitled "A New Sound."

DID YOU KNOW?

Many centers have already started green jobs programs. The following is an example of what the Curlew Job Corp Center in Washington is doing.

According to Jennifer Albert, the School-to-Work coordinator, the center has established a Garden Committee, Recycling Committee, student green leaders, and a Green Team Committee.

“Students are involved in all aspects of center “green” projects. They suggest and implement new green projects and are active participants on these committees,” notes Albert. At a recent Open House meeting, students suggested putting out water containers and paper cups instead of plastic bottled water.

The center has a strong recycling program, including plastics, aluminum, cardboard, and paper. Recycling continues into the career and technical training programs, too. In the welding program, steel is sorted and reused multiple times.

Curlew Job Corps Center also has a garden where students and staff grow vegetables to be used in the kitchen.

“There’s something about working in the dirt that is good for your soul; and being able to eat what you’ve nurtured, well, what could be better,” stated 21-year-old Tim Kennedy.

“We have students on the committee who have never been in a garden or have ever seen a tomato grow. Here, we are mixing our own soil and raising organic vegetables and fruit trees. It’s a quiet place to go after hours. It’s a win-win situation.”

ACTIVITY OVERVIEW

Activity Name	Activity Type	Duration	Number of Students Required	Page Number
Environment in the News	A warm-up investigation that invites students to explore advertisements in a newspaper to see how traditional jobs may be greening.	Approximately 10 minutes	1	8
The Commons	Small group activity that introduces students to the concept of individual and group acquisition and use of our shared natural resources.	Approximately 1 hour	3 - 8	9 - 12
A Green Job Corps	Independent activity that invites students to learn how new green-collar skills may be important in their future career path.	Approximately 30 minutes	1	13 - 15
It's Happening in My Backyard!	A case-study reading and creative activity that showcases green-collar success stories throughout the United States.	Approximately 40 minutes	1	16 - 17
Do a Green Job!	Students complete an environmental service project at their Job Corps Center that takes advantage of their current skills and area of interest in the environment.	Depends on nature of community service project	1	18 - 19

You can select only one activity to complete with students or you can complete them all. They are non-sequential activities and can be completed in any order. Student worksheets and handouts accompany this module and can be photocopied as needed.

At the end of each activity, there are suggested questions for assessment of the students. These questions can be posed to students to facilitate a group discussion or they can be answered individually, using paper or a computer.



WARM-UP INVESTIGATION: ENVIRONMENT IN THE NEWS

TIME: 10 minutes

**NUMBER OF STUDENTS
REQUIRED:** 1 or more

TRY THIS ACTIVITY IN:

- Career Preparation Period (CPP)/New Student Phase
- Academic Training: Reading

BACKGROUND:

Environmental issues are not something only discussed by a small group of people. Today, concern for the environment has gone mainstream, and America is at the beginning of a green shift. America is in a great transition period—we are moving from a fossil-fuel-based economy to a renewable resource economy. This green shift will affect jobs, neighborhoods, purchases, and behaviors.

WORDS TO KNOW:

Organic

STUDENTS NEED TO:

Pick up a daily newspaper or news magazine. They should flip through the paper until they find one ad that is related to the environment. Here are some examples of ads:

- Replace your windows and qualify for an energy rebate.
- Buy this organic milk, chocolate bar, or other product.
- Buy these shoes made from recycled soda bottles.
- Test drive our cars and trucks that get great gas mileage.

Once the students have selected an ad, have them answer the following questions verbally or in writing:

1. What is the ad trying to sell you?
2. What is the ad's link to the environment? What aspect of the environment does the ad try to promote? For example, if the ad is for an organic chocolate bar, the advertiser is saying that chemicals were not used to grow the chocolate. This helps protect our soil and water resources.
3. Name a job that someone does related to the product in the ad. For example, in the organic chocolate bar ad, people were hired to work in the plant where the chocolate bar was made, design a cool label for the chocolate bar, deliver the chocolate bar to stores, and design the ad that featured the chocolate bar.

WRAP-UP:

The jobs named in question 3 should all be pretty standard jobs, but they now have a green adaptation because the product is organic. The vocational trades offered by Job Corps integrate traditional skill development with green skill development. Green skills and knowledge can help provide career-track employment opportunities in environmentally friendly fields.

Ask the students: What vocational trade are you most interested in learning about at Job Corps? How can that trade become green?



GROUP ACTIVITY: THE COMMONS

TIME:

About 20 minutes to play the game and 30 minutes to complete the worksheet.

NUMBER OF STUDENTS REQUIRED:

3 to 8

TRY THIS ACTIVITY IN:

- Career Preparation Period (CPP)/New Student Phase
- Residential Living
- Academic Training: Science
- Student Government Association
- Trades and Applied Academics

DESCRIPTION:

A small group of students (3 to 8) can use this activity to explore the concept of individual and group acquisition and use of resources. At the same time, this activity provides us with a chance to look at how our shared environmental responsibility can provide green job opportunities.

WORDS TO KNOW:

The Commons
Green-collar jobs
Natural resources

OBJECTIVES:

Students will:

- Develop an understanding that we share common natural resources.
- Recognize the differences between needs and wants.
- See the benefits of sharing resources.
- Understand that protecting the environment may provide opportunities to earn a living.

MATERIALS:

- Plastic poker chips or other tokens (about 5 per player).
- A large bowl or container for the poker chips/tokens called, “the Commons.”
- A second container called the “reserve bowl” that is hidden. At the beginning of the game, the reserve bowl should contain one less chip than the total amount of chips in the Commons. For example, if you are playing the game with three people, the Commons should contain 8 chips and the reserve bowl should contain 7 chips. Be sure not to share how many are in the reserve bowl.
- A stopwatch (optional).
- “Taking Care of the Commons” worksheet (page 23)

PROCEDURE:

Part A

1. Prepare the Commons and the reserve bowl with the proper number of chips (as indicated in the *materials* section).
2. Have the group sit in a circle, either on the floor or in desks. The leader will be holding the Commons.

DID YOU KNOW?

Although 75 percent of the planet is covered in water, less than 1 percent is available for clean, potable drinking water.

3. Give the following directions to the students, being sure they understand them. After instructions have been given, allow them to ask questions. Tell them that during the game they cannot talk to the instructor or talk amongst themselves.

The rules for the game are as follows:

- For this game, the game bowl that contains poker chips/tokens is called “the Commons.”
- At the beginning of each round, the instructor will pass around the Commons. Each student has the choice to take three, or two, or one chips. You do not have the option of taking more than three or zero tokens.
- The tokens/chips belong to you. They are valuable because whenever you collect five, you are a winner. (Please note you must not say “the” winner, just “a” winner.)
- There will be a series of rounds. A round is over when the game bowl is passed around to everyone and returns to the leader. The round is also over if the Commons has no chips remaining.
- At the end of each round, the leader will add an amount of chips to the Commons (from the reserve bowl) equal to whatever is left. To expedite the game, the leader may choose to put only half of what is left in the bowl at the end of the round. If no chips remain in the Commons at the end of a round, no additional chips will be added by the leader.

4. The game is played in rounds. Each round can be played on a timed basis, 30 seconds for a complete round or less depending on the discretion of the teacher. It can also be done more leisurely and played until each player has a turn during the round.
5. There is no talking once the game begins. A student may not give another chip to someone else. It is optional for students to show or hide how many chips they have taken and how many they have accumulated.
6. The game ends when the container is empty or everyone has five chips. During the game, if a student has accumulated five tokens, they continue to play. (Note: While there may be some person that attains five chips, often the students use up all of the tokens before anyone has five. In some cases, one person may have attained the five while the others do not)
7. Let the game be played without initially trying to make any connections to their studies, green jobs, sustainability, etc. What often happens the first time the game is played is that the students run out of tokens and the game ends. Then, the instructor should look into the container and state the obvious, there are no more left to count and, therefore, you cannot replace anything. Ask for the winners and losers in the game and have them justify their responses.
8. Have everyone return their tokens.

INSTRUCTOR TIP:

In the first round, students will find that they run out of tokens quite quickly. This represents human use of natural resources at a rate faster than they can be replaced. In the second round, with the ability to converse with each other, students will find that their tokens (shared resources) last much longer. By taking less tokens, everyone will receive some. This round represents a sustainable human use of natural resources. In this round, there should be enough for everyone, today and into the future.

Part B

1. Play again. This time tell the students that the game is played with a new rule—they may talk with each other.
Discuss the following questions: Did everyone win? Why or why not? How was this outcome different than the first time the game was played?
2. If it is advantageous, play a third time and process the outcome again.
3. Ending the game. Tell the students that the Commons represents our common resources on Earth, such as water, trees, oil, or food. If you knew the tokens were food, would you share in the common good? What if the tokens were oil or some other nonrenewable resource? What if there was a point where we could not replenish the tokens because they have simply run out?

ASSESSMENT:

These questions may be used to facilitate a classroom discussion or small group conversations. Students may also record answers to the questions as an assignment to complete the activity.

Did the game change when you were able to talk with one another? In what ways did it make a difference? Were you willing to listen to each during the second game?

Did you want to let everyone win? Did it bother you to share in the winning of the game? If you had enough chips to get by until everyone won the game wasn't

that okay? Why or why not? What is the difference between needs (perhaps taking one token instead of three) and wants? As responsible citizens, should we restrain our wants if our needs are taken care of?

TAKING CARE OF THE COMMONS:

Green-collar jobs involve taking care of “the commons” or taking care of/improving common resources that we share. As an assessment tool, have students complete the “Taking Care of the Commons” worksheet. Students should name one of our shared natural resources. Next, students should ask themselves, “What does this resource mean to me?” “Why is sharing or protecting that resource important to the student’s life and well-being?” Thirdly, ask students to think of ways that we can all protect this resource. Finally, ask students to describe work that they can do to protect or enhance the resource. It is not important to come up with a job title, it is more important to think of jobs that the students can do or would be interested in doing.

DID YOU KNOW?

The average hourly wage for a green-collar worker in Berkeley, CA, is \$15.80 (plus benefits). This is \$4.00 an hour higher than Berkeley’s current “living wage” of \$11.35, with benefits.

Raquel Pinderhughes, San Francisco State University, Urban Studies Program, 2007

Example Table With Answers.

Student handout can be found in the appendix section on page 23 of the module.

TAKING CARE OF THE COMMONS

Common or shared resource	What it means to me	How can everyone protect it?	Describe work that you can do to protect this resource.
Water	<ul style="list-style-type: none"> I need clean safe water to be healthy. Water is required to grow food like wheat for bread and vegetables for a salad. Water is required in the production of meat. Farm animals require water to drink. Plants and animals in the wild require water to survive. There is a lot of water on Earth but most of it is ocean water and that's too salty. 	<ul style="list-style-type: none"> Use less water at home. Install devices that help us use less water. Reduce our waste production by recycling and composting. Protect lakes, streams, rivers, wetlands, and other water resources. Protect forests. 	<ul style="list-style-type: none"> Build and install rain barrels. Install timers on lawn sprinklers. Plant rain gardens. Landscape with native plants that need less water. Plant trees and other plants near waterways. Plant trees, shrubs, and grasses in community gardens and parks. Learn about water conservation in the plumbing and landscaping trades.
Forests	<ul style="list-style-type: none"> Forests provide animals with homes. Forests help keep my water clean. Forests are used to make homes, notebooks, newspapers, and furniture. Forests are harvested for lumber—I will use lumber in my job. 	<ul style="list-style-type: none"> Plant more trees. Harvest trees using sustainable forestry techniques. Control invasive species. Use forestry products, such as paper and lumber sustainably. Recycle paper and reuse wood. 	<ul style="list-style-type: none"> Use sustainably harvested lumber in carpentry projects. Fight fires. Create/upgrade city parks or create more community natural areas. Work with recycled paper products.
Energy	<ul style="list-style-type: none"> I need electricity to turn on the lights and power my appliances and electronics. I need energy to keep my home warm in the winter and cool in the summer. Gasoline and diesel help me get around by bus, subway, and car. Energy is used to heat water for my showers. 	<ul style="list-style-type: none"> Use energy more efficiently. Install devices that help us use less energy. Use alternative energy sources. Upgrade old technology to new technology. 	<ul style="list-style-type: none"> Weatherize homes. Install solar panels. Build wind turbines. Construct Leadership in Energy and Environmental Design (LEED) certified homes and offices. Build and install composters. Work on green transportation construction projects, such as trail building or extending subway or rail lines.
Soil	<ul style="list-style-type: none"> Healthy soil is required to grow my food. Healthy soil is needed to grow food for livestock. Healthy soil is important for growing trees, shrubs, crops, and gardens. Soil can be polluted by chemicals, oil, or garbage. 	<ul style="list-style-type: none"> Minimize the use of fertilizer and pesticide. Plant trees and shrubs to prevent erosion. Plant ground cover, such as grasses, or apply mulch. Leave stalks and roots in garden over the winter. They can trap snow and prevent wind erosion. 	<ul style="list-style-type: none"> Purchase organic produce for your restaurant. Create/upgrade city parks or create more community natural areas. Plant trees and other plants near waterways. Plant trees, shrubs, and grasses in community gardens and parks.



INDEPENDENT ACTIVITY: A GREEN JOB CORPS

TIME: About 30 minutes depending on method of research

NUMBER OF STUDENTS REQUIRED: 1

TRY THIS ACTIVITY IN:

- Career Preparation Period (CPP)/New Student Phase
- Career Development
- Trades and Applied Academics

DESCRIPTION:

Students will consider vocational programs offered at Job Corps Centers and discover how new green-collar skills may be important in their future career.

WORDS TO KNOW:

Green-collar jobs
Hormone-free
LEED
Nontoxic
Organic
Renewable materials
Reused

OBJECTIVES:

Students will:

- Identify some differences between traditional job skills and green-collar job skills.
- Recognize ways that their future vocation may require green-collar job skills.
- Understand that protecting the environment may provide opportunities to earn a living.

MATERIALS:

- “Traditional and Green-Collar Skills” worksheet.
- “Going Green With Your Future Career” handout.
- Computer.
- Access to vocational instructors (optional).

PROCEDURE:

1. Ask students to read the examples listed at the top of the worksheet.
2. Have them complete the table for their vocational program or for a program of your choice. If the students’ program is listed as an example, have them add an additional three to four bullets.
3. Have the students use the attached document, “Going Green With Your Future Career,” handout to help them find out more about green-collar skills connected to their vocation. Have them complete additional research on the Internet.
4. As an alternative, interview the vocational instructors at your center and ask them what green-collar skills are important for that program.

INSTRUCTOR TIP:

The traditional and green-collar skills listed on the next page can be found on the Training Achievement Records (TARs) for each vocation.

Example table with answers:

GOING GREEN WITH YOUR FUTURE CAREER

Trade	Traditional skills important in this career	Green-collar skills important in this career
Painting	<ul style="list-style-type: none"> • Prepare surfaces for painting using cleaning agents, surface conditioning agents, repair agents, and hand/power tools. 	<ul style="list-style-type: none"> • Prepare surfaces using environmentally friendly, odor-free, or nontoxic products. • Prepare surfaces using fewer products.
	<ul style="list-style-type: none"> • Select appropriate paint or coating for the project. 	<ul style="list-style-type: none"> • Identify green finishing materials: low/no toxic paints, sealants, stains. • Calculate the amount of paint or coating needed for a project and describe the “BUD system” (Buy only what you need. Use all of the product. Donate or properly dispose of leftover product).
Carpentry	<ul style="list-style-type: none"> • Explain how lumber is graded. 	<ul style="list-style-type: none"> • Identify Forest Steward Council (FSC) or Sustainable Forest Initiative (SFI) certified woods.
	<ul style="list-style-type: none"> • State the uses of various types of hardwoods and softwoods. 	<ul style="list-style-type: none"> • Define and describe the benefits of regional materials, rapidly renewable materials, salvaged materials, recycled content, bio-based materials, and onsite salvage use.
Culinary	<ul style="list-style-type: none"> • Follow a recipe to create a dish. 	<ul style="list-style-type: none"> • Prepare dishes using organic and/or regionally sourced products.
	<ul style="list-style-type: none"> • Order meat or produce from supplier. 	<ul style="list-style-type: none"> • Describe benefits of regionally sourced, organic, hormone-free products.
Bricklaying	<ul style="list-style-type: none"> • Identify basic bricklaying procedures—mixing mortar, laying mortar bed, laying bricks. 	<ul style="list-style-type: none"> • Describe the benefits of regional materials and salvaged materials and the percentages of recycled content.
	<ul style="list-style-type: none"> • Follow procedures for quantities of brick, mortar, and mortar materials. 	<ul style="list-style-type: none"> • Describe construction waste management/landfill system during construction or demolition and identify local companies that accept salvaged masonry materials.

ASSESSMENT:

Assessment can be done in a number of ways. These questions may be used to facilitate a classroom discussion or small group conversation. Alternatively, students may record answers to these questions as an assignment to complete the activity.

How do green-collar skills enhance traditional skills? Ask students to determine the shared resource they are protecting in their vocation. *For example, in the painting trade, using odor-free products can protect indoor air quality; in the carpentry trade, using FSC wood protects our forests.*

Leadership in Energy and Environmental Design (LEED) is a Green Building Rating System developed by the U.S. Green Building Council that provides a set of standards for environmentally sustainable construction. Many new projects are being constructed using LEED standards and many old buildings and houses are being retrofitted to meet LEED standards. Green Building Council members, representing every sector of the building industry, developed and continue to refine LEED. The rating system addresses six major areas:

- Sustainable sites—integrating sustainability concepts and practices into design, construction, operations, and maintenance activities.
- Water efficiency—including interior water efficiency, such as the types of piping used, as well as the types of faucets, sinks, etc., used throughout.
- Energy and atmosphere—focusing on energy efficiency; lighting; heating, ventilating, and air conditioning (HVAC); and appliances and equipment.
- Materials and resources—including the storage and collection of recyclables, as well as the use of renewable resources, recycled or reused content, and regional materials.

This also includes ensuring that materials and buildings are reused through the maintaining of existing walls, floors, roofs, and other interior nonstructural elements.

- Indoor environmental quality—considering strategies and systems that result in a healthy indoor environment for building occupants.
- Innovation and design process—considering innovative building features and sustainable building knowledge.

This means that to achieve LEED-certification, all trades have to interact with each other to ensure that the project is successful. How can the trades work together to ensure that all of the LEED certification requirements are met? What can you do in your trade to ensure that all trades are meeting LEED-certification requirements?

Some green-collar skills can help students save money for their future employers. For example, mixing the correct amount of mortar or using less products to prepare painting services can actually save a company money and be environmentally friendly at the same time. What green-collar skills in your table can help save money for your future employer?

DID YOU KNOW?

Pennsylvania passed an “alternative portfolio standard” in 2004, requiring 18 percent of the State’s power to come from alternative sources by 2020. In response to the demand for their product, Spanish wind-turbine manufacturer Gamesa set up its U.S. operations there. Gamesa now has four plants. One of the sites is a closed U.S. steel mill outside of Philadelphia—where 1,000 former steelworkers have gone back to work to manufacture wind turbines.

The Blue Green Alliance



CASE STUDY ACTIVITY:

IT'S HAPPENING IN MY BACKYARD!

TIME: About 40 minutes, depending on type of creative project selected

NUMBER OF STUDENTS REQUIRED: 1

TRY THIS ACTIVITY IN:

- Career Preparation Period (CPP)/New Student Phase
- Academic Training: Reading
- Career Development
- Trades and Applied Academics
- Student Government Association

DESCRIPTION:

Students will review and share a case study that showcases a green-collar success story. They will use their creativity to share, with their classmates, important facts about their case study and how it relates to their future.

WORDS TO KNOW:

Green-collar jobs

OBJECTIVES:

Students will:

- Develop awareness of green-collar jobs and green-collar role models.
- Recognize that people from similar communities have realized an economic and environmental benefit from green-collar jobs.
- Have a better understanding of the breadth of green-collar jobs.

MATERIALS:

- Case studies. They can be found in the Attachments and Student Handouts section starting on page 36. Look for additional case studies at <http://www.greenforall.org/resources/people-programs>.
- Art materials such as poster board, markers, glue.

PROCEDURE:

1. Ask each student (or pair of students) to select and read one case study.
2. Ask students to create one of the following creative expressions based on their case study:
 - Poster or drawing
 - Comic book
 - Computer-generated presentation
 - Written summary
 - Verbal presentation
 - Poem, song, or rap

INSTRUCTOR TIP:

Make sure students find a case study that they are interested in. Some case studies on the “People & Programs” page may be from the students’ city, or even their neighborhood.

3. The creative expression that each student completes must answer the following questions:
- What is the location of your case study? Determine the location down to the neighborhood level, if possible.
 - What green-collar job was your case study based on? For example, were the people in your case study recycling used building materials for the construction industry or retrofitting homes with energy saving devices?
 - Who are the people that are benefitting from the green-collar jobs? Describe them, their lives, their homes, anything you can about them.
 - What are the goals of the program you learned about?
 - What role would you play if that were your community?

ASSESSMENT:

Have a day for all students to have a walkthrough or presentation of the creative expressions. If there are very few students, they can partner and share their results with each other. Create a self assessment so that students can evaluate their own project. Hang posters in the hallways as inspiration and information for other students. Organize a field trip to a nearby program.

DID YOU KNOW?

The U.S. Green Building Council's 2009 Green Jobs report predicts that the green building industry will be responsible for the creation or support of 7.9 million jobs.

“Where justice is denied, where poverty is enforced, where ignorance prevails, and where any one class is made to feel that society is an organized conspiracy to oppress, rob, and degrade them, neither persons nor property will be safe.”

-Frederick Douglass, Abolitionist, Speech April 1886



SERVICE ACTIVITY: DO A GREEN JOB!

TIME:

Depends on activity selected by student

NUMBER OF STUDENTS REQUIRED: 1

TRY THIS ACTIVITY IN:

- Career Preparation Period (CPP)/New Student Phase
- Career Development
- Student Government Association

DESCRIPTION:

The best way to put their new knowledge to the test is to try it out! Students will complete an environmental service project at their Job Corps Center. They will develop a project that takes advantage of their current skills and an area of interest in the environment.

WORDS TO KNOW:

Compact fluorescent light (CFL)
Composting
Energy audit
Environmental service project
Power vampire

OBJECTIVES:

Students will:

- Gain hands-on experience by completing an environmental service project.
- Develop project-specific skills.
- Gain a sense of pride in completing a project that benefits their center and the environment.

MATERIALS

- Materials will change depending on the nature of the service project. Students should take advantage of easily accessible and affordable materials and supplies.

PROCEDURE:

1. Allow students to consider the project they would like to complete. They can choose from a list of suggestions (see next page) or create their own project. They can research project ideas on the Internet or request the assistance of an instructor in becoming skilled in a certain task, e.g., weather stripping around doors.
2. After some consideration, the student and instructor should come to agreement on the service project. The project may require the support of center administration, maintenance staff, other students, or instructors.
3. The students should complete the project within a certain time period as determined by them and the instructor.

DID YOU KNOW?

In California, between 1995 and 2008, green businesses increased 45 percent, green jobs grew 36 percent, while total jobs in the State grew only 13 percent.

Next 10's Annual California Green Innovation Index

ENVIRONMENTAL SERVICE PROJECT IDEAS:

- Plant trees around buildings for energy conservation.
- Begin a composting, vermicomposting, or recycling program.
- Hold a composting or recycling “how-to” workshop.
- Create posters with environmental messages for around the center.
- Conduct an energy audit. A Simple Energy Audit for Schools can be found in Student Activity #3, page 13, at http://www.epa.gov/climatechange/emissions/downloads/page_layouts_R_pocket.pdf or try the energy survey at <http://pltgreenschools.org/>. Instructors will need to register on the Project Learning Tree (PLT) Web site in order to use the Green Schools’ resources.
- Replace incandescent bulbs with Compact Fluorescent Light bulbs (CFLs).
- Coordinate a waste-free day.
- Build bird houses or bird feeders from recycled materials, such as 2-liter soda bottles or milk cartons.
- Do a tire pressure check of all vehicles on campus.
- Complete weatherization projects, such as weather stripping, caulking, and sealing gaskets.
- Create an art project out of recycled materials that has an environmental message.
- Make signs for light switches that remind everyone to “turn it off when you leave the room.”
- Organize a grounds cleanup day.
- Plant and tend a garden. Donate the produce to a local food bank or use the produce in the cafeteria.
- Find power vampires in your center and stamp them out.

ASSESSMENT:

Assessment can be done in a number of ways. These questions may be used to facilitate a classroom discussion or small group conversation. Alternatively, students may record answers to these questions as an assignment to complete the activity.

Ask the student what skills they developed while completing their project. What parts of the project went really well? What parts were the most fun? What would they do differently next time? *This project could help students decide on their vocational pathway.* In which vocational training program would your service project fit? *For example, if the student completed a tree planting project, in which vocational training program would you find these skills? Perhaps landscaping, urban forestry, or firefighting.*

How has their project helped their Job Corps Center? What common resource has been enhanced or protected by their actions? Have other students joined in or become interested as a result of their community service project?

DID YOU KNOW?

Power Vampires are devices that keep sucking electricity even after you think you’ve turned them off! Look for the glowing light-emitting diode (LED) lights as a sign that electricity is still being used. Electronics in particular are almost always power vampires. They include TVs, DVD players, laptop chargers, modems, printers, and MP3 chargers. To solve this, either unplug them or add a power strip for ease of turning them on and off.

GREEN JOBS EXTENSION ACTIVITIES AND LINKS

Start a garden at your center. The School Garden Web site by the Food and Agriculture Organization (FAO) contains practical support for teachers, parents, volunteers, and secondary school students who would like to establish or improve a school garden. It gives step-by-step guidance on how to set up and run a school garden. Visit <http://www.fao.org/schoolgarden/>.

Complete a construction project at your Job Corps Center that incorporates all the trades and uses reclaimed construction materials. Visit PlanetReuse to find reclaimed building materials at <http://www.planetreuse.com>.



Visit the Green America Web site. Their mission is to harness economic power—the strength of consumers, investors, businesses, and the marketplace—to create a socially just and environmentally sustainable society. This site contains information on green buying and green businesses and tips on sustainable living. Visit <http://www.greenamericatoday.org>.

The Apollo Alliance is a coalition of labor, business, environmental, and community leaders working to catalyze a clean energy revolution that will put millions of Americans to work in a new generation of high-quality, green-collar jobs. Visit <http://apolloalliance.org>.

The Blue Green Alliance is a national, strategic partnership between labor unions and environmental organizations dedicated to expanding the number and quality of jobs in the green economy. Visit <http://www.bluegreenalliance.org>.

Green For All is a national organization working to build an inclusive green economy strong enough to lift people out of poverty. Visit <http://www.greenforall.org>.

Green the Block is a national campaign and coalition aimed at helping low-income communities of color become driving forces of the clean-energy economy. Visit <http://www.greentheblock.net>.

“Since new developments are the products of a creative mind, we must therefore stimulate and encourage that type of mind in every way possible.”

George Washington Carver, American scientist/botanist

WORDS TO KNOW

- Alternative energy**—Energy created from sources that do not use up natural resources or harm the environment. Wind energy is an alternative energy source.
- Air pollution**—Man-made or natural substances in the air that may interfere with human health and/or produce harmful environmental effects.
- Carbon Dioxide (CO₂)**—A naturally occurring, colorless, odorless gas that is also a byproduct of burning fossil fuels. This gas is exhaled from humans and animals during respiration and is also absorbed by plants during photosynthesis. It is also one of the main gases responsible for climate change.
- Climate change**—A term for a significant change from one climatic condition to another. Sometimes, climate change is caused by natural processes. Today, we are experiencing human-caused climate change as a result of burning of fossil fuels.
- Commons, The**—Land or resource that we all share. The Commons include water, air forests, and soil.
- Community supported agriculture (CSA)**—A food production model where farms receive money from customers up front in exchange for produce throughout the growing season. The aim of CSAs is to increase the quality of food and the quality of care given to land, plants, and animals while substantially reducing the potential food losses and financial risks for farmers.
- Compact fluorescent light (CFL)**—A type of bulb that uses 75 percent less energy than a traditional incandescent bulb uses while giving off the same amount of light. They generally last 10 times longer than traditional bulbs.
- Composting**—The process by which food scraps and garden waste are collected so that they can decompose naturally. They are most often collected in an outdoor aerated bin called a composter. The result of decomposition is a soil-like, nutrient-rich fertilizer.
- Conservation**—The protection and wise use of both living and nonliving resources such as water, plants, animals, and fossil fuels. Conservation is done not only for human benefit, but for the benefit of the environment.
- Energy audit**—An inspection, survey, and analysis of the flow of energy (electricity and heating and cooling) in a building or house. It is conducted to find opportunities to improve the building's energy efficiency.
- Energy efficient**—An appliance or system that uses the least amount of energy to operate. An energy efficient fridge uses less energy to keep food cool when compared to a regular model.
- Environment**—The surroundings in which all living and nonliving things occur naturally, including air, water, land, animals, and human beings.
- Environmentally friendly**—Goods, services, and practices that have created minimal or no harm to the environment or have created environmental benefits. Some products and services are marked with eco-labels to indicate how they are environmentally friendly.
- Environmental service project**—Activities, such as cleaning up streams, composting, hanging bird feeders, or planting trees, that have a direct, positive impact on the environment.
- Fertilizer**—Any substance put on or in soil to improve the quality or quantity of plant growth. Fertilizers can be natural or human-made.

- Fuel efficiency**—A measure of the usable energy produced by fuel combustion. Fuel efficiency in vehicles can be measured by the number of miles driven per gallon of gas.
- Global warming**—A term used to describe an increase in the near surface temperature of the Earth. Global warming is one of the expected impacts of climate change.
- Green**—Something having environmentally friendly characteristics or objectives.
- Green job**—Positions in agriculture, manufacturing, construction, installation, and maintenance, as well as scientific and technical, administrative, and service-related activities that contribute substantially to preserving or restoring environmental quality (International Labor Organization).
- Green-collar job**—Blue-collar jobs that have been created or adapted to help protect or improve the environment. Example: manufacturing a sport-utility vehicle (SUV) would be a blue-collar job—manufacturing a hybrid would be a green-collar job.
- Green economy**—An economy that generates jobs, businesses, and investments while taking advantage of clean energy; improving energy efficiency; reducing greenhouse gas emissions, waste, and pollution; and conserving water and other natural resources.
- Greenhouse effect**—A natural phenomenon where the atmosphere near the Earth's surface is warmed. Without the greenhouse effect, our planet would be frozen. The greenhouse gases trap heat near the surface of the Earth. As atmospheric concentrations of greenhouse gases rise, the average temperature of the lower atmosphere increases.
- Greenhouse gas**—Natural and man-made gases in the atmosphere that trap heat near the surface of the Earth. Water vapor (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) are the primary greenhouse gases in the Earth's atmosphere.
- Heat island effect**—Urban areas that are hotter than surrounding rural areas. This effect is caused by heat loss from urban infrastructure such as buildings, roads, and houses.
- Hormone-free**—When a product, such as milk, yogurt, chicken, or beef, has been produced or grown without the use of growth or vaccination hormones.
- Hybrid**—A vehicle that combines both a traditional gasoline-powered engine with a rechargeable energy storage system to achieve better fuel efficiency.
- Incandescent bulb**—The most common yet least energy-efficient light bulb. It emits light due to the glowing of a heated filament inside it. Most of the energy used by incandescent bulbs is used to create heat rather than light.
- Invasive species**—Term used to describe nonnative plants or animals that negatively affect the habitats they invade.
- Leadership in Energy and Environmental Design (LEED)**—A Green Building Rating System developed by the U.S. Green Building Council that provides a set of standards for environmentally sustainable construction.
- Natural resources**—Products or services from the Earth that are used by humans. Examples include water, oil, forests, animals, and soil.
- Nontoxic**—Products that are not composed of or do not result in substances that are harmful to the environment or human health.
- Organic**—Products made of naturally occurring substances or food grown without the use of man-made chemicals.

- Pesticide**—A natural or man-made substance used for preventing, destroying, or repelling any pest, such as insects, weeds, and animals. Man-made pesticides often harm nontarget species and may cause contamination or other negative environmental effects.
- Power vampire**—Devices that still consume energy even after you turn them off. Electronics, in particular, stay in “stand-by” mode after you turn them off, and they continue using power.
- Recycle**—The process of collecting and reusing materials for the production of new goods on the same quality level.
- Reduce**—Decrease waste production by using less.
- Renewable materials**—A resource that is capable of being naturally restored or replenished, such as a forest. Lumber is considered a renewable material if the source forest can be replanted at a rate that is equal to or greater than the rate at which it is harvested.
- Renewable resource**—A substance of economic value that can be replaced or replenished as it is used.
- Reused**—Products that are given a second or third life prior to recycling or disposal. Example: using a coffee can to hold nuts and bolts.
- Salvaged materials**—Various items such as bricks, beams, car parts, and windows that have been saved or recovered from previous work sites, buildings, or cars that can be used again.
- Solar panel**—Device that is able to harness the power of the sun and turn this energy into electricity for a building or home.
- Sustainability**—Meeting human needs today without compromising the ability of future generations to meet their own needs. (Based on the “Brundtland definition” of the 1987 Report of the World Commission on Environment and Development.)
- Wind turbine**—A device that harnesses wind through a propeller system. Wind spins the propeller creating an electric current.

ATTACHMENTS & STUDENT HANDOUTS



TAKING CARE OF THE COMMONS

Green-collar jobs involve taking care of “the commons”—taking care of or improving common resources that we share. Complete the following:

1. In the table below, name one of our shared resources.
2. In your own words, list what that resource means to you.
3. Then name one way everyone can protect it.
4. Next, describe work that you can do to protect or enhance that resource. It is not important to come up with a job title, it is more important to think of jobs that you can do or would be interested in doing.

Common or shared resource	What it means to me	How can everyone protect it?	Describe work that you can do to protect this resource.
Example: Water	<ul style="list-style-type: none"> • I need clean safe water to be healthy. • Water is required to grow food like wheat for bread and vegetables for a salad. • Water is required in the production of meat. Farm animals require water to drink. • Plants and animals in the wild require water to survive. • There is a lot of water on Earth but most of it is ocean water and that’s too salty. 	<ul style="list-style-type: none"> • Use less water at home. • Install devices that help us use less water. • Reduce our waste production by recycling and composting. • Protect lakes, streams, rivers, wetlands, and other water resources. • Protect forests. 	<ul style="list-style-type: none"> • Build and install rain barrels. • Install timers on lawn sprinklers. • Plant rain gardens. • Landscape with native plants that need less water. • Plant trees and other plants near waterways. • Plant trees, shrubs, and grasses in community gardens and parks. • Learn about water conservation in the plumbing and landscaping trades.

TRADITIONAL AND GREEN COLLAR SKILLS

Trade	Traditional skills important in this career	Green-collar skills important in this career
Example: Painting	<ul style="list-style-type: none"> • Preparing surfaces for painting, using cleaning agents, surface conditioning agents, repair agents, and hand/power tools. 	<ul style="list-style-type: none"> • Preparing surfaces using environmentally friendly, odor-free, or nontoxic products. • Preparing surfaces using fewer products.

GOING GREEN WITH YOUR FUTURE CAREER

The following is a list of Job Corps Career Technical Training Programs. Under each program is a listing of ways your vocational training program is going green. Green-collar skills may be an asset in helping you find a job after graduation.

ACCOUNTING SERVICES

- Depending on the location of your job, there may be incentives such as grants, rebates, or tax credits for your customers. Some States and counties offer these financial benefits to people who make environmentally friendly changes, such as installing solar panels or upgrading insulation. You can research these programs on State government Web sites.
- Customers may ask how they can make donations to environmental organizations or companies.
- Customers may request that documents be paperless. One option may be to share all documents on Universal Serial Bus (USB) drives.

AUTOMOBILE TECHNICIAN

- Your customers may ask for environmentally friendly products, such as environmentally friendly windshield washer fluid and motor oil. New windshield washer products are methanol-free and are less harmful to the environment. Some new motor oil is made from animal fat.
- You can make car owners aware that if they maintain their vehicles regularly, they will run more efficiently and be better for the environment.
- You can share fuel-efficiency tips with customers, such as maintaining proper tire pressure and removing heavy objects from roof and trunk.
- You may need additional training to work on hybrid or flex-fuel vehicles. Over time, these vehicles will make up a larger percentage of the vehicle market. Taking these training sessions now may help you get a job.



BRICKLAYING

- Bricks are a perfect product to use in green construction. They have a long life, they are often produced locally, and they absorb and store heat until needed. They are fire resistant and provide insulation. Bricks are often made of recycled materials and are themselves highly recyclable.
- There are no Leadership in Energy and Environmental Design (LEED)-certified products but some bricks and pavers can contribute to a building's LEED rating. Bricks can contribute to LEED points in the following areas: if the bricks have recycled content, if the bricks are a regional material, if bricks or pavers assist in stormwater control, if bricks or tiles minimize heat island roof, if bricks are made from low emitting materials, and if bricks are used in innovation in design.
- Customers may ask about bricks that are more environmentally friendly. Some bricks are made out of ash produced from the burning of coal. Old brick can also be ground up and made into new brick.
- Customers may ask for locally produced bricks to reduce shipping, air pollution, and greenhouse gas emissions.

BUSINESS TECHNOLOGY/BUSINESS ADMINISTRATION

- You can play a big role in greening your office. Knowledge of green business practices can increase your chances of getting a job and in being selected over someone with more work experience.
- Most electronic companies offer environmentally friendly machines, such as printers, fax machines, copiers, and computers. These machines use much less energy and can power down when not in use.
- Can your office switch to paper with recycled content? This may include copy and print paper as well as paper towels and facial tissue.
- Many companies are “going paperless” by sending documents via e-mail or using USB drives instead of printing. You may be in an office that counts the number of copies and print jobs of its employees.
- To reduce the environmental and economic cost of meeting in person, many organizations are using teleconferences and Web meetings. How can you learn more about these technologies?

CARPENTRY

- Green carpentry means looking for environmentally friendly options in wood, flooring, framing, windows, doors, siding, roofing, and insulation.
- You may be asked to use sustainably harvested wood. There are two main certification systems for sustainably harvested wood:
 - The Forest Stewardship Council (FSC) promotes the responsible management of the world’s forests. Wood that has been certified by the FSC will have a special logo. The FSC has established a set of 10 principles that apply to all certified wood and paper products. These principles include the consideration of environmental impact, indigenous peoples’ rights, and other benefits from the forest. Using FSC wood can contribute to LEED points.
 - The Sustainable Forestry Initiative (SFI) promotes sustainable forest management and considers all forest values. Wood that has been certified by the SFI will have a special logo. The SFI has established a set of nine principles that apply to all certified wood and paper products. These principles include sustainable forestry, responsible practices, and protection of water resources.
- More and more companies are recycling leftover/unused wood and/or giving it away to other groups who use wood products. What are the places in your community that accept leftover wood or offcuts?



CEMENT MASONRY

- The significant energy used to produce concrete, and the mining of raw materials such as aggregate, impact the environment. However, there are many new exciting ways that this industry is going green. One way is to include waste materials in the production of concrete. These waste materials may include construction waste and ash from coal power plants.
- Traditional concrete accounts for more than 5 percent of human-caused carbon dioxide emissions annually. New types of cement actually absorb CO₂ over time.
- Cement can contribute to LEED points by its color. “White” or light-colored Portland cement can reduce heat absorbed by buildings and, therefore, reduce energy costs.
- Pervious concrete pavements can contribute to LEED points because it has a high permeability that allows water to flow through easily. Pervious concrete pavements can reduce stormwater runoff because they increase infiltration of stormwater.



COMPUTER NETWORKING/CISCO/COMPUTER TECHNICIAN

- Most electronic companies offer environmentally friendly machines such as printers, fax machines, copiers, and computers. These machines use up to 40 percent less energy and can power down when not in use.
- There are new environmentally friendly wireless routers that go on standby when not in use, and only provide power to the ports that are in use. This technology can save money and the environment.
- Most counties provide depots for old or broken computer equipment. Find a depot near you by visiting the county Web site. Be sure to recycle old or broken equipment. Many parts can be reused and other components can be melted down to make new computer parts. The U.S. Environmental Protection Agency (EPA) requires proper disposal of any electronics waste.

CULINARY ARTS

- You may work in a restaurant or food service facility that uses or specializes in organic or local food. Organic fruits, vegetables, meat, dairy, and wine have been grown, raised, or produced without the use of chemicals. Locally produced food supports local agriculture and businesses and reduces transportation costs, as well as greenhouse gas emissions.
- Some food service facilities are connected with Community Supported Agriculture (CSA). These organizations are like cooperatives where members share in the benefits and risks of farming. This is one method of getting produce and meat directly from the farmers and allows restaurants to create menus from fresh, local ingredients. It supports the local economy and reduces the cost of bringing in products from far away.
- Does your food service facility compost? Many restaurants are now separating vegetable and fruit scraps for composting. Your restaurant can sign up for composting pick-up services similar to recycling pick-up services.
- Your food service facility may be interested in promoting sustainable fish choices such as those on the Monterey Bay Aquarium’s Seafood Watch List.



ELECTRICAL

- You may want to learn more about Energy STAR-rated appliances and fixtures for your customers. These products must meet strict energy efficiency guidelines set by the EPA and U.S. Department of Energy and include entire homes, appliances, home electronics, lighting fixtures, fans, furnaces, light bulbs, and more.
- Learning about ways to save electricity is an advantage in the workplace. Your customers may request lighting timers that turn on lights for specific periods of time or programmable thermostats that automatically control house temperature. Both of these devices can reduce electricity bills as well.
- When people buy wind turbines and solar panels, they will require new electrical wiring and installation. They may also be interested in options that allow them to sell excess power back to the power company.

GENERAL CONSTRUCTION

- Energy Star is an international standard for energy-efficient consumer products. Energy Star has also set standards for buildings and facilities that are rated based on energy-saving performance. The ratings are used by building and energy managers to evaluate the energy performance of existing buildings and industrial plants. The rating systems are also used by the EPA to determine if a building or plant can qualify to earn ENERGY STAR recognition.
- LEED is a green building rating system that sets standards for environmentally sustainable construction. LEED-certified buildings are supposed to use resources more efficiently compared to conventional buildings that are simply built to code. LEED-certified buildings often provide healthier work and living environments, which contribute to higher productivity and improved employee health and comfort.
- Installing low-e glass windows into buildings and homes helps to reduce heat loss and allows rooms to be warmed by sunshine. Specially designed coatings are applied to one or more surfaces of window's glass. Heat that originated from indoors is reflected back inside, thus keeping heat inside in the winter; and sunlight is reflected away, keeping it cooler inside in the summer.
- There are many things that can be done throughout construction projects to reduce water waste when the building is complete. Various water-conserving products, such as dual flush toilets and low-flow faucets and showerheads, can be installed to improve water management in buildings.



HEATING VENTILATION AND AIR CONDITIONING REPAIR

- Customers may request information on high-efficiency furnaces and air conditioning systems, including heat exchangers and geothermal heat pumps that help to reduce energy use.
- Geothermal heat pumps are an alternative and energy-efficient heating and cooling system. They take advantage of the temperature difference between the air and ground (or water) to create heating and cooling. They simply transfer heat from one area to another. The heat pump extracts heat from the ground, which remains at a relatively constant temperature year-round. It can also be used in reverse in the summer to keep buildings cool.
- Learn how to make a home even more energy efficient. For example, if a customer has purchased a high-efficiency heating, ventilating, and air conditioning (HVAC) system, but has very inefficient windows and doors, that customer may not see the full benefits of the new system.
- Most States provide grants to homeowners if they make energy-efficiency upgrades. Before you talk to your customer, find out more about grants and rebates in your region.
- Coolants, which are used to prevent overheating in air conditioners, can be very harmful to the environment. By recycling coolant you are helping to keep ethylene glycol out of the environment.
- Energy Star products are available for air conditioning and heating systems. Air conditioners with Energy Star certification are up to 14 percent more efficient than a normal air conditioner and can cut cooling costs by up to 30 percent.

HEAVY EQUIPMENT OPERATIONS/REPAIR

- Find out about the used oil regulations in your county. One gallon of used oil can contaminate 1 million gallons of water.
- Are used parts available for repair? Used parts from automotive scrap yards and other recycling programs can save your customers money and can save the environment.

HEAVY TRUCK DRIVING

- Biodiesel is a cleaner burning diesel replacement fuel made from natural, renewable crops, such as soybeans or canola, or recycled cooking oil from restaurants. It is an alternative fuel that has been proven to reduce air pollution and greenhouse gases. By using biodiesel instead of regular gas or diesel, exhaust can be reduced by 27 to 94 percent.
- Driving heavy vehicles can produce more exhaust and emissions. Maintenance and operating issues such as under-inflated tires, cold running engines, transmission malfunctions, brake dragging, and misaligned wheels can all contribute to poor gas mileage and essentially more emissions. By checking these items regularly, you can reduce emissions from your vehicle.
- There are some commonly held myths about the idling of diesel engines. If you use a diesel engine, manufacturers recommend that diesel engines run for no more than 3 minutes before driving. Letting an engine idle actually does more damage to the engine than starting and stopping. Running an engine at low speed (idling) causes twice the wear on internal parts compared to driving at regular highway speeds, and can increase maintenance costs and shorten the life of the engine.

LANDSCAPING

- Your customers may request information on native plants (local to your region). Native plants are those that evolved naturally and were found growing naturally in the area before human settlement. Native plants have evolved and adapted to local conditions over thousands of years. They are vigorous and hardy and can survive winter cold and summer heat. Once established, they require little irrigation or fertilization. They are resistant to most pests and diseases.
- Xeriscaping is an innovative type of landscaping that conserves water and protects the environment. It generally involves replacing grassy areas with drought-resistant native plants as ground cover.
- Some counties may have water restrictions in the summer—this may affect the plant varieties you choose. Get informed on the types of water restrictions in your city or county. If there are no water restrictions, you can still encourage water conservation by discussing water-efficient landscaping, sprinkler timers, rain barrels, and rain gardens.
- You may want to suggest composting to your customers. Overgrown plants, cut branches, spent flower heads and fall leaves can all be composted. Some counties have a pick-up program for organic materials. Others may have a regional composting program where homeowners can take their plant materials. Find out what composting programs are available in your area.



LICENSED PRACTICAL/VOCATIONAL NURSE

- Instead of single-use items, there are new options available, such as instrument sanitization and instrument recycling to reduce waste.
- Clothing companies are beginning to offer organic scrubs. Look for a scrub exchange or used scrub store in your area. They accept used scrubs for resale after sanitization and mending.
- Most electronic companies offer environmentally friendly machines such as printers, fax machines, copiers, and computers. These machines use much less energy and can power down when not in use.
- Can your office switch to paper with recycled content? This may include copy and print paper, as well as paper towels and facial tissue.



MATERIAL AND DISTRIBUTION OPERATIONS

- Some trucks come equipped with devices that provide a real-time, integrated system for traffic, fuel consumption, and driving distances. These systems help reduce costs by improving work efficiency and lowering emissions.
- Can packaging be reduced or done using environmentally friendly products? By reusing packaging materials and increasing the use of recycled components, packaging waste can be reduced.
- Many companies now have a returnable packaging program. Find out if your suppliers participate in a similar program or if they use recycled/reusable packing materials.
- Today, many packing peanuts are made from biodegradable cornstarch. These peanuts can be reused or composted. They also completely dissolve in water.

PAINTING

- Paints contain chemicals called Volatile Organic Compounds (VOCs). They are used in paint to prevent freezing and improve paint flow, leveling, and curing. They enter the air as a gas when paint is applied. Besides their odor, they can contribute to poor indoor air quality. Today, paint contains significantly less VOCs than paints of the past. The EPA regulates VOCs in paints and those regulations may be getting tougher in the coming years.
- Look for natural paints and paints with low-VOCs or zero-VOCs. These paints are durable, cost-effective, and less harmful to human and environmental health. They reduce indoor air pollution, which according to the EPA, is one of the top five hazards to human health.
- Some paints and related products (paint thinners/strippers) contain hazardous components. Although latex paint is less harmful to the environment and human health than oil-based paint, all types of paint should be handled and disposed of properly. You can dispose of paint products at your local hazardous waste collection program.
- Find out about paint disposal regulations in your city, county, or State. In most cases, there are regulations you need to follow.
- Practice good cleaning habits: be sure to wash brushes and rollers in a sink or similar drain so it is treated instead of ending up in a storm drain and in our water supply.

PHARMACY TECHNICIAN

- Does your pharmacy post signs and attach notices to medication bottles about the importance of medication recycling? A small amount of medication in our water supply can have a dramatic effect on aquatic plants, animals, and on our water supply.
- You may be able to promote environmentally friendly products sold in the pharmacy. These products may include natural and/or organic soaps, lotions, hair products, paper products, sunscreens, and cleaning products.

PLUMBING

- Which sinks, tubs, showers, faucets, dishwashers, clothes washing machines, etc., use the least amount of water? Make use of Energy Star products that certify the water efficiency of these machines.
- A small drip from a worn faucet washer can waste 20 gallons of water per day. Larger leaks can waste hundreds of gallons.
- It's easy and inexpensive to insulate water pipes with preslit foam pipe insulation. You'll get hot water faster plus avoid wasting water while it heats up.
- Electronic or hands-free taps preserve water and lower the transference of germs. Installation of these products can conserve up to 70 percent more water than the use of regular taps.
- In a typical home, the toilet accounts for about 30 percent of water use. Dual-flush and low-flow toilets significantly reduce the amount of water used when flushing.
- Demand (tankless or instantaneous) water heaters provide hot water only as it is needed. They heat the water directly without the use of a tank. They don't produce the standby energy losses associated with storage water heaters, which can save your customers money.
- Tankless coil and indirect water heaters use a home's space heating system to heat water. These water heaters use a heating coil or heat exchanger installed in the main furnace or boiler. Whenever a hot water faucet is turned on, the water flows through the heat exchanger. These water heaters provide hot water on demand without a tank.



URBAN FORESTRY

- Trees trap and hold airborne pollutants (dust, ash, pollen, and smoke) that can damage human lungs.
- Trees produce enough oxygen on each acre for 18 people every day.
- As they grow, trees take carbon dioxide out of the air and transform it into roots, leaves, bark, flowers, and wood. Over the lifetime of a tree, several tons of carbon dioxide are absorbed from the air.
- By providing shade and transpiring water, trees lower air temperature and, therefore, cut energy use, which reduces the production of carbon dioxide at the power plant.
- Heavy equipment use around trees can cause damage to underground roots. This compaction can kill surrounding trees and lead to erosion.
- Leftover underbrush and branches can be put into piles to create wildlife habitat. Birds, rodents, snakes, and insects will use these piles for shelter, nesting, and hibernation.
- Mulching around newly planted trees and shrubs helps conserve moisture, minimize weed growth, and maintain even soil temperatures.

WELDING

- Welding “fumes,” including particles and smoke, tend to float off into the air. Today, fume extraction filtration systems catch these particles before they go into the air, which helps to protect the environment and your health.
- Solar-powered welding helmets contain a battery-free auto-darkening lens. This helps save money on batteries, reduces the need for battery disposal, and prevents battery pack overheating.



CASE STUDY #1

ON THE FRONT LINE IN THE FIGHT AGAINST DIRTY ENERGY: VETERANS GREEN JOBS

This case study is from Green for All, 2009, at <http://www.greenforall.org>.

Based out of Boulder, CO, Veterans Green Jobs launched the first class of 15 trainees in April 2009 for a 9-week Green Jobs Training Program that taught veterans skills in home weatherization and energy efficiency. In the program, veterans learned how to audit a building to identify where energy is being wasted. They learned to caulk leaky holes, install energy-efficient appliances, and insulate attics. And, they learned and worked alongside other veterans, a best practice for supporting veterans' successful transition back into civilian life.

Veterans Green Jobs is a nonprofit organization that provides not only green jobs training, but also individualized mentoring and support services with the aim that every participant realizes his or her maximum potential and secures meaningful, living-wage work. Veterans represent a field-tested workforce, dedicated to serving a mission greater than themselves. This makes them ideal for positions in the new green economy, helping to rebuild, revitalize, and green our communities.

Veterans Green Jobs Training Programs vary from short 2-month intensive programs to full academic-year programs, both residential and nonresidential, in order to create as many gateways to higher green education and green career development as possible for veterans.

Already, Veterans Green Jobs has seen the positive response that their trainees get when out in the field accompanying trained home energy auditors. Veterans have a unique capacity to talk to the public about the need for energy efficiency.

But Veterans Green Jobs isn't limiting its program to energy efficiency. The program is getting veterans out in nature building trails, reducing fire hazards, and planting trees. Using satellite imagery, Veterans Green Jobs plans to identify the heat sinks in particular communities and to support the urban reforestation that will cool those cities. Additional courses will soon be offered in disaster preparedness and response, biodiesel production and grease-car conversions, and green building and historic building preservation. Veterans Green Jobs is also working on an initiative to secure foreclosed properties and use them as green retrofit training sites. As part of the program, Veterans Green Jobs is working with unions to have the projects designated as pre-apprenticeship training sites. After the homes are renovated for energy efficiency, they will be sold back to veterans, enhancing both the physical and social infrastructure of the local community.

The Veterans Green Jobs Academy is currently being piloted in Colorado, Washington, and Louisiana. It will be expanding into 5 to 10 additional States by the end of 2010. For more information, visit <http://veteransgreenjobs.org>.

CASE STUDY #2

CALIFORNIA YOUTH ENERGY SERVICES

This case study is from *Green for All*, 2009, at <http://www.greenforall.org>.

Teenagers working with California Youth Energy Services (CYES) are turning urban neighborhoods into greener, healthier places to live by offering residents simple energy-saving repairs and advice. Bearing gifts of compact fluorescent light (CFL) bulbs and water-saving faucets, young workers engaged by CYES visit homes in their communities to conduct energy audits and offer simple energy-saving repairs. They are creating greener, healthier neighborhoods and preparing themselves for green jobs.

The program, run by Rising Sun Energy Center of Berkeley, CA, hires nearly 90 teenagers each summer from urban neighborhoods in nearby cities, trains them on people skills and energy efficiency practices, and sends them out to homeowners and renters who have requested energy audits.

“Our aim is to reduce household gas and electricity use while training the next generation of environmental leaders,” said Jailan Adly, program director of Rising Sun Energy Center.

Arriving in pairs, the CYES teenagers measure the household electricity, gas, and water consumption and, then, offer residents help in reducing this usage by switching out incandescent light bulbs for CFL bulbs, installing water-saving faucet-heads, and offering retractable clotheslines to use instead of energy-gulping clothes dryers. The results are not only kilowatt hours of electricity and cubic meters of water saved, but also community bonding from neighbors helping neighbors and self-esteem in the young people performing the services.

“We are really committed to giving young people with barriers the chance to excel and gain skills,” said Jodi Pincus, executive director of Rising Sun Energy Center.

CYES recruits 15- to 22-year old students from local high schools and community centers, seeking youth who need opportunities. It offers them a summer job paying \$9 to \$10 an hour and a chance to make a difference in the world if they can prove they are committed to the task. The youth sometimes describe

it as life-changing. “If I wasn’t doing this, I’d probably be in the streets doing something negative,” said one CYES participant, Derrick Walker, from Richmond, in a recent interview by CYES.

The program has been so successful that in 8 years, 400 teenagers have been trained as “energy specialists,” and they’ve retrofitted more than 9,000 homes and 11 shelters. From its first year involving 15 kids working on 200 homes in 1 city, the program now takes nearly 100 kids each summer from 9 Bay Area communities. They audit and offer repairs on 2,100 households a summer.

Local utilities fund the program. The Bay Area’s main electric and gas utility, Pacific Gas & Electric Co., compensates Rising Sun for every kilowatt hour of electricity and cubic meter of gas saved in the households audited. With that money, Rising Sun buys the CFL bulbs and clotheslines and pays salaries. The local water utility, East Bay Municipal Utility District, pays the organization based on water saved at households audited. It also supplies the water-saving faucet fixtures.

Thanks to State laws that require utilities to promote energy conservation and compensate for amounts saved, the program is a partnership between the utilities and the nonprofit Rising Sun Energy Center, whose mission is focused on inspiring young people to believe they can make a difference in the environment.

And, what a difference they are making. Rising Sun and CYES figure the program has saved households about \$2 million in utility costs and removed enough carbon from the air to be the equivalent of 3,000 cars taken off the road.

According to Pincus, “We are committed to saving energy and water, to training young people in the professional skills they need to be the leaders of the future, and to lessening climate change.”

To learn more, visit <http://www.risingsunenergy.org/>.

CASE STUDY #3

AMERICAN YOUTHWORKS

This case study is from *Green for All*, 2009, at <http://www.greenforall.org>.

In central Texas, where 36 percent of teenagers drop out of high school, American YouthWorks gives at-risk youth in Austin's poorest neighborhoods a second chance, offering hands-on training in green construction and conservation along with academic classes for a high school diploma.

Each year, young people who might otherwise face homelessness, a return to prison, or just disengagement from the system are instead building green homes, installing solar-paneled rooftops and insulation by morning and taking math, history, and English classes in the afternoon.

American YouthWorks enrolls about 1,000 young people each year in its charter high school designed to inspire kids who have dropped out of conventional high schools. Some of the students choose to participate in the Casa Verde Builders Service Learning Program constructing green, energy-efficient homes in Austin's inner city neighborhoods. Others take part in the Environmental Corps, restoring park lands and learning conservation skills. Still others choose the Computer Corps, rebuilding computers from recycled parts and learning computer skills.

The Casa Verde Builders students have built 105 green homes since the program's inception more than a decade ago, teaching themselves a marketable skill, while bringing the benefits of energy efficiency to their neighborhoods.

"They were built entirely from the ground up by our young adults once considered hopeless and on their way to prison. Now, they are on their way to green jobs and a green sustainable future," said Richard Halpin, founder and chief executive officer of American YouthWorks.

He is talking about sustainable futures for students like Rye, a homeless young man who, after dropping out of high school multiple times, completed his general education degree while in the Casa Verde

Builders program. He now has a construction job on a crew retrofitting one of Austin's biggest hospitals. Another example is a young woman named Katrina, who grew up in an abusive home, got tangled up in drugs and a prison sentence, and eventually was disowned by her parents. In her darkest hour, she turned to American YouthWorks for help. She now has skills in environmental conservation, a high school diploma, and an apprenticeship that is helping her support her baby son.

Using many recycled and energy-efficient materials like galvanized recycled-steel roof shingles, the Casa Verde Builders are creating houses that are 30 to 40 percent more energy efficient than the typical older Austin home.

"That they're building a house is one of the reasons our program is so successful," said Chester Steinhauser, a staff director of Casa Verde Builders. "If you take a young person who has not accomplished much yet in his or her life, for him or her to be able to build something and then be able to stand back and say this is what I did, that makes a great metaphor for rebuilding his or her own lives."

The Casa Verde Builders program has received numerous awards including the Points of Light Foundation Presidential Service Award, Promising and Effective Practices Network (PEPNet) Effective Initiative Award, Texas Society of Architects Citation of Honor, and U.S. Dept. of Commerce Housing and Urban Development Best Practices Award. American YouthWorks is a YouthBuild affiliate, while Casa Verde Builders is also part of the national Corps Network and is part of the AmeriCorps National Volunteer Service program, which means participants are provided health care and a living allowance.

For more information about American YouthWorks, please go to its Web site at <http://www.americanyouthworks.org/>.

CASE STUDY #4

BUILDING WORKPLACE DEMOCRACY AND GREEN INDUSTRY IN THE BRONX

This case study is from Green for All, 2009, at <http://www.greenforall.org>.

Emerging from the environmental justice movements of the South Bronx in New York City, Green Worker Cooperatives has gained national fame for its integration of workplace democracy with an innovative green business model. Since 2003, the organization has coordinated lobbying, consulting, and fundraising efforts to create worker-owned green industry across the South Bronx. It also held a series of courses, called the Green Worker Academy, to help local people transition into green careers in cooperatives. Early in 2008, Green Worker Cooperatives opened its first cooperative: Rebuilder's Source, whose worker-owners bring in construction supplies destined for the landfill and set them up for re-use with new projects.

In this densely populated neighborhood, dependence on heavy trucking has long been a serious environmental health hazard. While the State government has typically focused on reducing environmental impact in the communities where waste ends up, Rebuilder's Source is boldly working towards a zero-waste South Bronx. The organization believes that drastic reductions in the amounts of

waste trucked out daily will have clear impacts on air quality and public health.

As part of its business plan, Green Worker Cooperatives set the ambitious goal of opening Rebuilder's Source with enough funding to last for 5 years of operation, independent of profits. In 2006, the study was concluded, a business plan was laid out, and fundraising began in earnest. The State government has provided the greatest amount of aid to the project, with many private foundations and churches contributing heavily as well.

This far-sighted plan for Rebuilder's Source is now allowing the young cooperative to take its time in developing strong skills among its worker-owners, and close relationships with local builders. For late 2008, the co-op developed a major marketing push, expanding both its consumer and donor base. Already, the cooperative has received more donations of building supplies than expected and has received a flurry of glowing media attention in outlets ranging from Men's Vogue to the New York Times.

CASE STUDY #5

BAY AREA WOMEN GROWING GREEN BUSINESSES, CREATING HEALTHY JOBS

This case study is from Green for All, 2009, at <http://www.greenforall.org>.

Based in the San Francisco Bay Area, WAGES (Women’s Action to Gain Economic Security) works to build worker-owned green businesses that create healthy, dignified jobs for low-income immigrant women. Over the past decade, WAGES has built three successful green-housecleaning cooperatives that have given hundreds of women the opportunity to become financially secure, gain business skills, and lead healthier, fuller lives. WAGES is currently launching an ambitious effort to significantly expand its co-op network throughout the San Francisco Bay Area to involve 200 or more worker-owners by 2010.

By using a cooperative business model, WAGES helps women pool their skills and work together to succeed. The workers make decisions democratically, and they distribute business profits equitably to all workers. As co-owners of successful businesses, women increase their incomes substantially and help their families move out of poverty.

In California, approximately 30 percent of employed Latinos live in poverty. By developing worker-owned enterprises, WAGES not only creates high-quality jobs, but it is also helping women develop an effective asset-building strategy. In addition to their earnings and benefits, each member has an “internal capital account”—composed of their share of the business’ retained earnings—that increases in profitable years. Accumulating assets in this

way frees co-op members from living paycheck to paycheck, allowing them to strengthen their financial self-sufficiency and improve their families’ quality of life.

By joining a WAGES-affiliated co-op, low-income Latinas who previously had little or no exposure to environmental health education are now also using least-toxic products and techniques at home, and they are sharing information about these alternatives with their neighbors. Every day, professional cleaners risk their health and safety by working in confined spaces, using harsh and toxic chemicals, and performing repetitive motions, yet they are rarely protected by health insurance.

Because of the high levels of environmental pollution in poor communities and communities of color, Latinas in substandard cleaning jobs face the double threat of unhealthy conditions at work and at home. By working in a WAGES-affiliated co-op, members reduce their own and others’ exposure to toxic substances: in 2007, the three WAGES co-ops served more than a thousand households throughout the Bay Area. WAGES’ eco-friendly cleaning practices also prevent significant amounts of toxic cleaning chemicals from being released into the air and water.

For more information or to get involved, contact <http://www.wagescooperatives.org>.

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