



Community Service Day

Student Outreach Leader's Guide



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Are you ready to meet the future? The youngsters attending our Community Service Day will be our colleagues and customers in just a few short years. Their ideas, beliefs, and imaginations will shape the world we live in. And you have the chance to help them take hold of that world with science. This guide will show you how.

Overview

We have developed two sets of learning materials for use with students at this Community Service Day:

1. Energy Conservation

One set of materials is designed to raise student (and family) awareness about the importance of conserving energy and provide ideas for reducing energy use in the home. There are two learning activities:

Activity One Sticker Shock

This activity asks students to match some familiar energy-saving behaviors with “price tags” that show how much money and how much energy each would typically save over the course of a year. As explained below, you can use this activity for a game-show-style presentation.

Activity Two Be a Vampire Slayer

This activity introduces the concept of “vampire” electronic devices that drain energy even when they are supposedly turned off. It challenges students to find the names of ten vampire devices in a word-search puzzle, and provides a checklist so that they can continue their hunt for vampires at home.

2. Water Conservation

The second set of learning materials is designed to raise student (and family) awareness about the importance of conserving water and provides ideas for reducing water use in the home. Again there are two activities:

Activity One Slow the Flow

This activity guides students along a game board through three areas of the home, challenging them at each step to come up with a water-saving tip that starts with one of the letters in the word “water.” Five water-saving tips are provided for each area of the home, so the challenge is primarily to re-phrase these tips to meet the rules of the game. This activity can also be used for a game-show-style presentation.

Activity Two Water, Water Everywhere

This activity presents students with a different type of word-search challenge. It lists ten additional tips for conserving water in the home, with the letters that spell the word “water” hidden one or more times in each tip. Students circle the letters W-A-T-E-R to find this hidden water.

3. A Message to Parents

To help extend this learning experience, we have also provided a letter for students to take home to their parents. The letter informs parents about what their child has learned about energy and water conservation at our Community Service Day, and encourages parents to reinforce this learning by working with their child to put these conservation principles into practice around their own home.

Presentation Tips

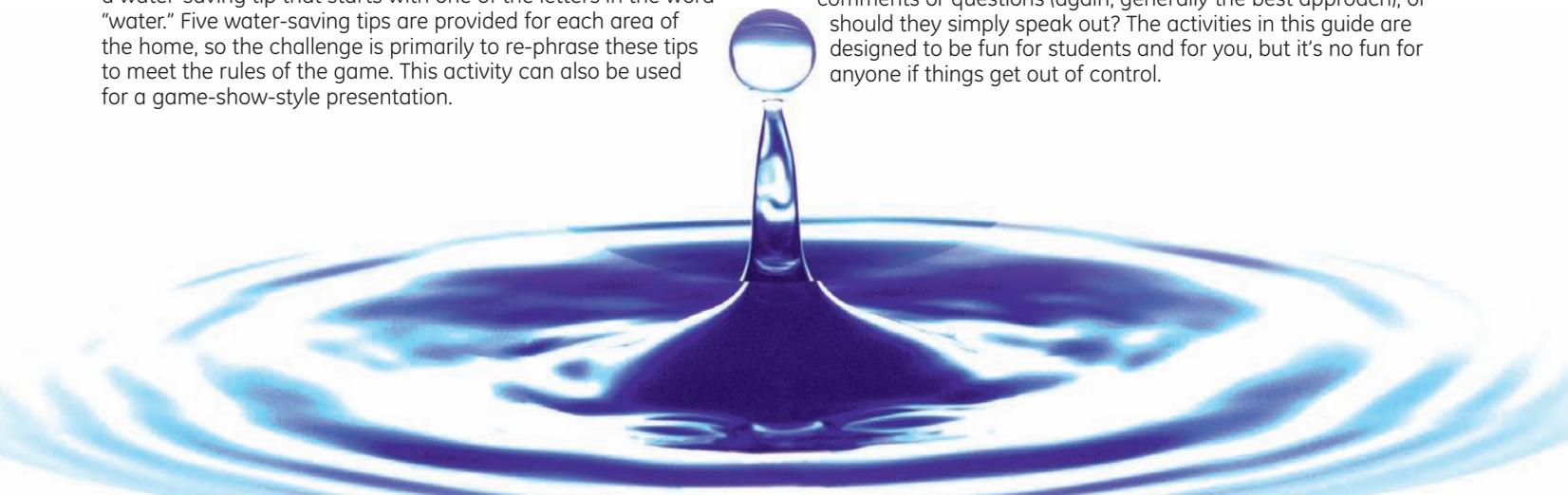
If you are new to engaging with youngsters at a Community Service Day event, the following tips can help you prepare for a fun and effective presentation.

Attitude

It's important to approach students with an open, friendly, and upbeat attitude. Let them know that you are excited about getting to know them and getting the chance to share your enthusiasm for our work at GE. Try to model the attitude we want to promote in today's youngsters—curiosity, respect for other people's ideas, and a keen interest in learning.

Expectations

To help students stay focused, it is important to establish your expectations up front. For example, do you want questions during your presentation (generally best for this age group) or at the end? Do you want students to raise their hands when they have comments or questions (again, generally the best approach), or should they simply speak out? The activities in this guide are designed to be fun for students and for you, but it's no fun for anyone if things get out of control.



Flexibility

This guide should help you feel well prepared for your presentation, but when you're working with youngsters, it's also important to remain flexible so that you are ready to take advantage of "teachable moments"—those times when something unexpected happens that provides an opportunity for you to make an important point or connection. Listen for that unanticipated comment, look for that unexpressed question, and take a break from your presentation plan to create a moment of real insight.

The Opening

Try to capture your students' attention with the first words you speak. Your opening should let them know immediately that what you have to tell them will be interesting and fun. For example, you could start a presentation about energy conservation with the rhetorical question, "Are you ready to get energized?" And you might start a presentation

on water conservation with this old riddle: What runs and runs but never gets tired? (It's water flowing from a faucet.)

Introductions

Be sure to spend just a minute or so talking about yourself. Tell the students where you work and what you do at GE, and maybe a little about your background. This is your chance to help the students feel that they know you, and help them feel a personal connection to GE.

Showmanship

Some people take to the spotlight, some people don't. If you're a natural ham, you will probably enjoy presenting activities game-show-style, as described below. If not, consider calling for a student volunteer to host the show. Either way, try to make your presentation a special occasion—engaging, entertaining, and fun!

Using the Energy Conservation Activities

Activity One Sticker Shock

Introduce this activity by asking students to name some ways we can save energy around the home. They will probably have plenty of ideas—turning off lights when you leave a room, turning down the thermostat, using energy-saving compact fluorescent light bulbs, etc. Make the point that most of us know *how* to save energy, but not many people know *how much* energy—and how much *money*—they are actually saving.

Distribute the activity sheet (or display it onscreen) and explain that you are going to play a game to help students find out how much they can save by conserving energy. Point out the five energy-saving behaviors described on the activity sheet, and the five price tags that show different amounts of savings. Ask the group which behavior they think pays off with the biggest savings (price tag A), then choose one student to give an answer while allowing the rest of the group to offer suggestions and encouragement.

Reveal that the correct answer is behavior No. 3, *Lower the heat by 1 degree on your thermostat*. Help students see the basis for this answer by reminding them that it takes a lot of energy to heat a whole home, and that saving even a small portion of so much energy can mean very big savings.

Build on this reasoning by asking students to name the behavior they think will yield the smallest savings (price tag E). Again, choose one student to give the answer. Ask the student to explain the reasoning behind her or his choice, then reveal that the correct answer is behavior No. 4, *Lower the temperature on your water heater by 1 degree*. Remind students that a water heater holds a much smaller volume than a whole house, and even though it operates at a higher temperature, it has the home heating system to help it reach

that temperature. So any way you look at it, a water heater will use much less energy than a home heating system, and saving a small portion of a small amount of energy means much lower savings.

Continue this game show routine through the remaining energy-saving behaviors and price tags, helping students articulate the rationale for each pairing. Then wrap up the activity by emphasizing that every energy-saving behavior, big and small, contributes to energy conservation. If time permits, have students add up the total annual monetary savings for the game's five energy-saving behaviors and multiply that amount to calculate the savings for 1,000 families, as directed on the activity sheet. Then raise the stakes by calculating the savings for 100,000 families (\$4.586 million), and for a million families (\$45.86 million), to close your presentation with a strong demonstration of the potential of everyday energy conservation.

Activity Answers: 1-C, 2-D, 3-A, 4-E, 5-B. Total savings for one family: \$45.86. Total savings for 1,000 families: \$45,860.

Activity Two Be a Vampire Slayer

This activity is designed for students to complete on their own, whether during free time at the Community Service Day event or afterwards at home. Distribute the activity sheet to students at the end of your presentation, and encourage them to share it with members of their family.

If time permits, you can set the stage by explaining that the activity gives students another easy way to save energy and another good example of the way small savings can make a big difference for energy conservation. Talk briefly about "vampire" electronic devices and ask students to name some of the vampires they have seen in their own homes. Then point out that vampire devices consume about \$11 billion dollars worth of electrical power every year. That's a huge amount of energy we could save simply by unplugging electrical devices when we're not using them.



Using the Water Conservation Activities

Activity One Slow the Flow

Introduce this activity by using the facts in paragraph one of the activity sheet to help students understand why it is important to conserve water. They may not realize that we have a very limited supply of water on Earth, since only 1 percent of the planet's water is actually usable by humans. The rest is salt water or locked away in glaciers and deep underground. Explain that there are already more than 1 billion people around the world who do not have enough water to meet their needs, and that this number will jump to around 4 billion by the year 2050. Remind students that they will be running the world by that time, so this is a challenge they need to start thinking about today.

Distribute the activity sheet (or display it onscreen) and explain that you are going to play a game to help students learn some ways we can all start conserving water around the home. Point out that the game covers the three areas of the home where most people use the most water—the bathroom, the kitchen, and outdoors. These are also the places where we can save the most by using water wisely.

Explain that the students will take turns moving space-by-space along the path through these three areas, and that for each space they will have to come up with a water-saving tip for that area of the home. But here's the challenge—they have to state their tip in a way that starts with the letter they have landed on. Point out that all the tips they need are already provided on the activity sheet. The trick is to re-phrase those tips so that they start with the right letters.

To show students how it works, start the game yourself with a water-saving tip for the bathroom that starts with the letter W. (See below for a suggestion.) Then call on a student to come up with a water-saving tip for the bathroom that starts with the letter A. Continue along the path, calling on students spelling-bee-style for each tip. You can also set a time limit to increase the competitive pressure and add to the fun.

Conclude the game by congratulating students on their verbal agility and encouraging them to play the game with their families to help spread the word about conserving water.

Activity Answers: Following are suggestions for re-phrasing the water-saving tips on the activity sheet to start with the letters that spell WATER.

- **Bathroom**

When you hear running water long after a flush, you have a toilet leak and should fix it.

Always drop trash in the trash can instead of flushing it down the toilet.

Turn off the faucet while brushing your teeth and lathering your hands.

Every time you take a shower, make it five minutes or less.

Reduce your water use by installing a low-flow showerhead.

- **Kitchen**

Wash fruits and vegetables in a partially filled sink, not under a running faucet.

Always keep cold water in the fridge instead of filling your glass at the faucet.

Take time to defrost frozen food in the fridge instead of under a running faucet.

Every time you run the dishwasher, make sure you have a full load.

Repair a dripping faucet by replacing the washer.

- **Outdoors**

Water garden plants at their roots; don't water the leaves.

Always clean sidewalks, driveways, and decks with a broom instead of a running hose.

To control the flow from a garden hose, use a trigger nozzle

Every time you wash your car, use a bucket of water instead of a running hose.

Reduce evaporation by using lawn sprinklers in the morning or evening.

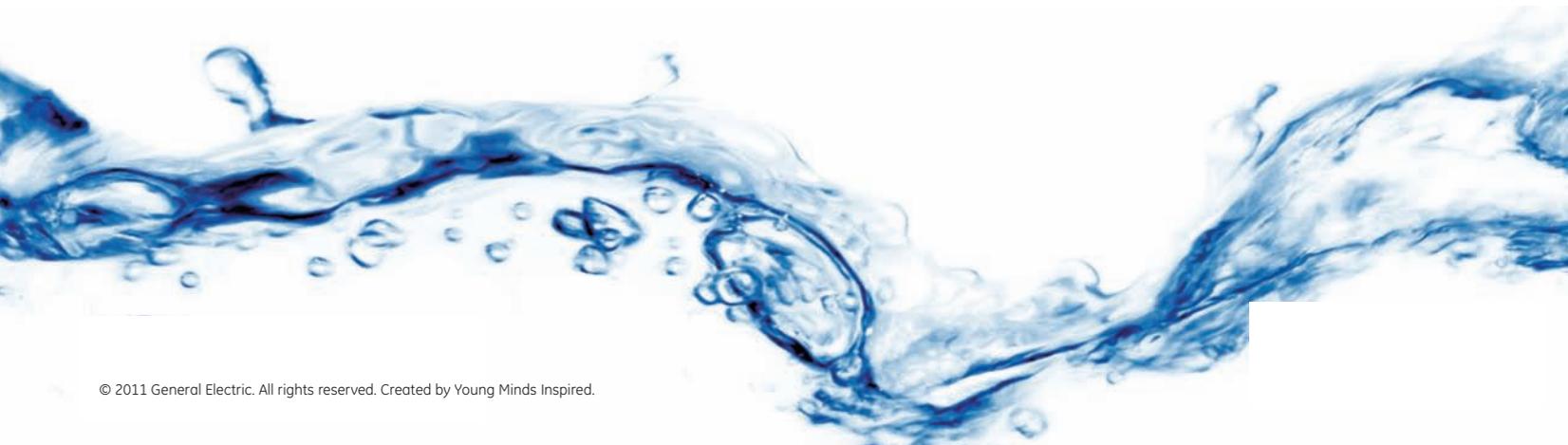
Activity Two Water, Water Everywhere

This activity is designed for students to complete on their own, whether during free time at the Community Service Day event or afterwards at home. Distribute the activity sheet to students at the end of your presentation, and encourage them to share it with members of their family.

If time permits, you can use the tips on this activity sheet and the game sheet to help students appreciate the need to start conserving water. Take a show-of-hands poll to find out, for example, how many students have a dripping faucet at home, how many let the faucet run while brushing their teeth or lathering their hands, how many use a running hose to wash the family car, and so on. The results will likely confirm the fact that most American families waste water without even realizing it. That's why it's important to raise awareness about water conservation, starting in the students' own homes.

Using the Message to Parents Handout

Distribute this handout to students and ask them to pass it along to their parents, or you can make the handout available to parents directly when they drop off and pick up their child.



Activity One

Energy Conservation Sticker Shock

You already know that saving energy is important. And you probably already do things at home to help reduce your family's energy bill. But do you really know how much you are saving?

Here are five easy ways your family can save energy. Test your energy smarts by matching each one to the price tag that shows how much money and energy your family could save if you practiced that energy-saving behavior for a whole year. The answers might surprise you!



1. Replace 1 light bulb with a Compact Fluorescent Light (CFL).



2. Switch to cold water for 1 load of laundry each week.



3. Lower the heat by 1 degree on your thermostat.



4. Lower the temperature on your water heater by 1 degree.



5. Use the microwave to cook 1 meal each week.

A.

Save \$23.15 per year and enough energy to power your home for more than 6 days.

B.

Save \$9.88 per year and enough energy to power your home for more than 3 days.

C.

Save \$7.05 per year and enough energy to power your home for nearly 2 days.

D.

Save \$4.68 per year and enough energy to power your home for more than 1 day.

E.

Save \$1.10 per year and enough energy to power your home for about 7 hours.

Energy savings add up, whether you are saving a lot or just a little. How much money would your family save each year if you practiced all these energy-saving behaviors? What would the savings be if 1,000 families followed your example?



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Activity Two

Energy Conservation

Be a Vampire Slayer!

Do you have vampires in your home? You do if you have electronic devices that keep using energy even when they are turned off. That clock on your coffee maker? That ready light on your rechargeable toothbrush? Those are the signs of "vampires" at work, sucking away energy all the time. And their energy-sipping adds up to a lot of lost power. Experts estimate that vampires add about \$11 billion to the U.S. energy bill every year!

It's easy to fight this menace—just unplug your energy vampires. But first you have to find them. For practice, see if you can find the energy vampires hiding in this word-search puzzle. Their names are listed below. If you get stumped, you can find the answers online at www.ymiclassroom.com/pdf/GEVampireSlayer.pdf.



Energy Vampires

Use this checklist to hunt for vampires in your home. Add the names of other vampires you find. Then save energy by unplugging every vampire you can!

- COMPUTER
- CORDLESS PHONE
- DVD PLAYER
- DVR
- LAPTOP CHARGER
- MICROWAVE
- PHONE CHARGER
- PRINTER
- TELEVISION
- VIDEO GAME CONSOLE
- _____
- _____



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Activity One

Water Conservation Slow the Flow

Water is probably our most precious resource. We cannot live without it. And although water covers about 70 percent of the Earth's surface, all but about 3 percent of all that water is salt water. People need fresh water, and most of the Earth's fresh water supply is frozen in glaciers or too deep underground for drilling. That leaves only about 1 percent of all the world's water for people to live on.

When you do the math, you can see why it's important to conserve fresh water. And here's a game to help you start conserving water in your own home. The game takes you through the three areas of a home where we use the most water, and where we can save the most by using water wisely. Take turns moving along the path from letter to letter to spell "water." Each time you land on a letter, come up with a water-saving tip for that area of the home that starts with the letter you land on. When you finish, you'll have 15 tips whose first letters spell WATER three times—that's three times more water for everyone!

Need a hint? You can use the water-saving tips listed below. But you will have to rephrase them to start with the letters in WATER. And no fair using the same tip twice!

W		A	T	R	E
A	R	W	E		T
T	E		R	W	A
BATHROOM		KITCHEN		OUTDOORS	

Water-saving tips:

Bathroom

- Don't let the faucet run while brushing your teeth and lathering your hands.
- Drop trash in the trash can instead of flushing it down the toilet.
- If you hear running water long after a flush, you have a toilet leak and should fix it.
- Install a low-flow showerhead.
- Make your shower time five minutes or less.

Kitchen

- Clean fruits and veggies in a partially filled sink, not under a running faucet.
- Defrost frozen foods in the fridge, not under a running faucet.
- Fix a dripping faucet by replacing the worn-out washer.
- Keep cold water in the fridge instead of filling your glass at the faucet.
- Make sure you have a full load when you run the dishwasher.

Outdoors

- Clean sidewalks, driveways, and decks with a broom instead of a running hose.
- Don't water the leaves of garden plants. They need water at their roots.
- Use a bucket of water to wash your car instead of a running hose.
- Use a trigger nozzle to control the flow from a garden hose.
- Use lawn sprinklers in the morning or evening to reduce evaporation.

Take this sheet home and talk with your family about the importance of saving water. Check off the tips you can start practicing today!



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Activity Two

Water Conservation

Water, Water Everywhere!

Experts say that the average American uses about 100 gallons of fresh water every day. But you can find lots of easy ways to use less water. Just look at the ten water-saving tips below.

Now look again. You won't find the word "water" in any of these tips. But you can find the letters that spell "water." The numbers tell you how many times you can find those letters in each tip. Circle the letters W-A-T-E-R to see if you can find them all! The first one is started for you. And if you need more help, you can find the answers online at www.ymiclassroom.com/pdf/GEWaterWater.pdf.



Don't l@t the f@ucet r@un w@hen you're washing dishes by hand. (2)



Adjust your bath temperature while the tub fills instead of running the faucet. (1)



Wait until you have a full load before running your clothes washer. (2)



Always turn off faucets tightly to avoid wasteful drips. (2)



Compost vegetable waste instead of tossing it down the garbage disposal. (1)



Instead of rinsing, scrape dishes before putting them in the dishwasher. (1)



Adjust sprinklers to avoid wetting sidewalks and driveways. (3)



Use mulch around garden plants to control weeds and keep roots wet. (2)



Upgrade old toilets with today's more efficient low-flow models. (2)



Stop leaks around garden hose couplings with plastic washers. (1)



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A Message to Parents

Thank you for bringing your child to today's Community Service Day event. We hope that she or he enjoyed learning more about how we can all help meet the resource challenges facing us today by taking simple steps to conserve energy and water. To help you reinforce these lessons in your own home, we provide here some background on the importance of energy and water conservation, along with tips to help your family start saving energy and water.

Saving Energy

Over the past 25 years, worldwide energy consumption has increased by about 60%, and experts predict that it will increase by another 30% over the next two decades. To meet this increasing demand, we need to develop new sources of energy, like wind and solar power. But the most economical source for more energy is already available today—energy conservation. By finding ways to use energy more efficiently, we can slow down the growth in energy consumption and get more out of our current energy resources.

Here are some easy ways your family can save energy:

- Replace incandescent light bulbs with compact fluorescent lights.
- Always turn off lights when you are not using them.
- Unplug “vampire” electronic devices that consume electricity even when they are supposedly turned off.
- Lower the heat on your home thermostat.
- Keep your car tuned up and your tires properly inflated.

We hope that you will adopt some of these energy and water saving practices. Working together, with a combination of common sense and imagination, we can meet the resource challenges that face us, and set an example of success for the next generation.

Saving Water

Worldwide, there are now more than 1 billion people who do not have enough water to meet their everyday needs, and that number is expected to rise to around 4 billion in coming decades. Even in the United States, there are many areas where water is already in short supply. Companies like GE are working to increase water resources by developing technologies to remove the salt from ocean water, but the most economical solution to our water shortage is once again conservation—finding ways to use water more efficiently and get more done with the water we have.

Here are some easy ways your family can save water:

- Repair or replace leaking faucets and toilets.
- Use the shower instead of the bathtub, and limit showers to 5 minutes or less.
- Turn off the faucet while brushing your teeth or lathering your hands and when washing dishes by hand.
- Wait until you have a full load before running your dishwasher or clothes washer.
- Clean sidewalks and decks with a broom instead of a hose.



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