

Service Learning for Kids
**Climate Change
& Global Warming**

GRADES 6 & UP

A Kids' Guide to Climate Change & Global Warming

How to Take Action!

Cathryn Berger Kaye, M.A.

Global warming world map

Carbon footprints

Water audits

Youth summits

Alternative energies

Cool foods

Green comics . . .

and more



A Kids' Guide to Climate Change & Global Warming

How to Take Action!

Cathryn Berger Kaye, M.A.

free spirit
PUBLISHING®



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What Kids Think

of Combating Climate Change & Global Warming

"These natural disasters have made us know more about what is truly important—our lives, our families, our neighbors, and how we can find ways to help each other."

—Rebecca, age 14

"We had more project ideas than we could ever do. So we decided to make Earth Day last until we complete all our ideas. And then if we have more ideas, we will just keep going!"

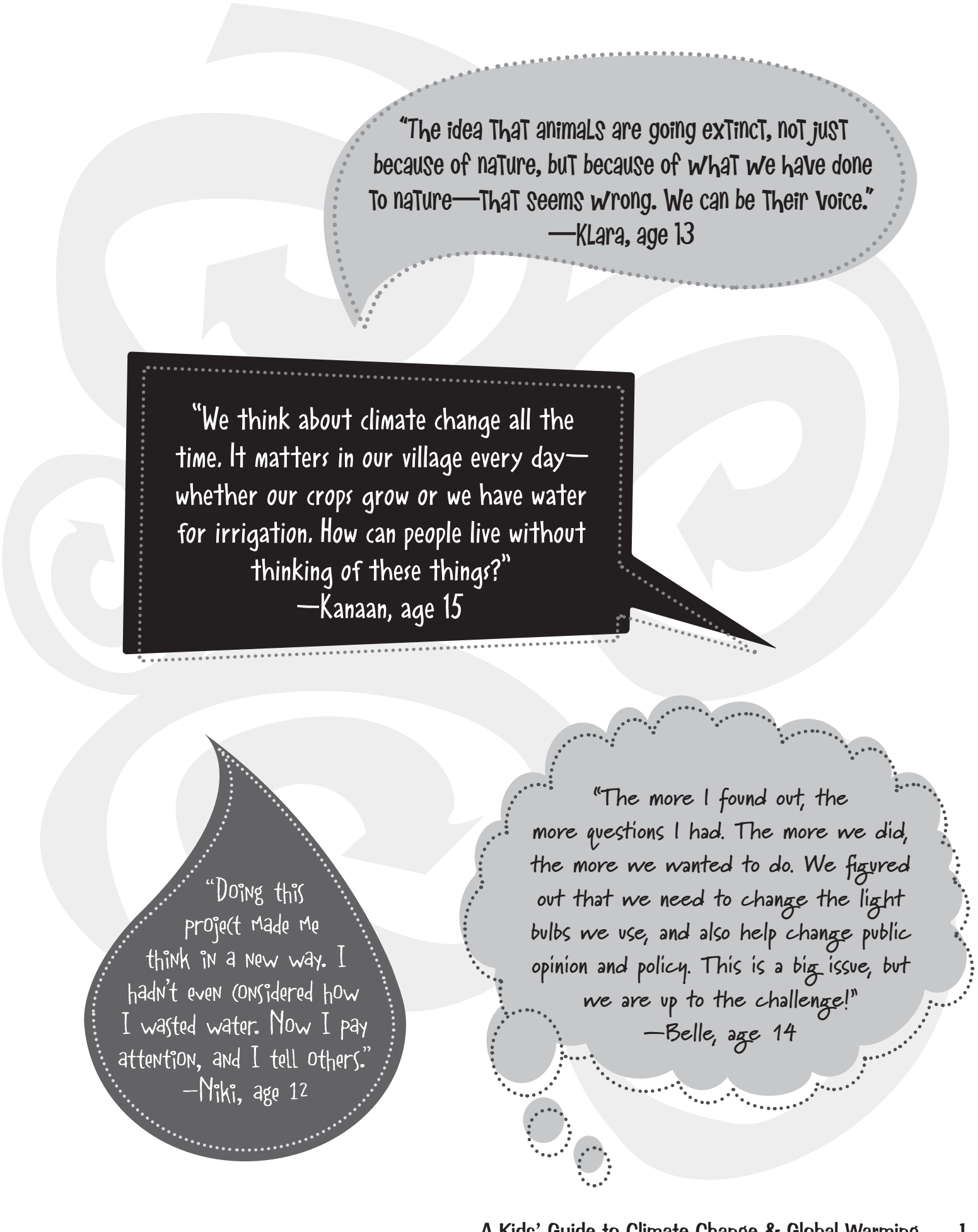
—Matt, age 11

"We are the generation that can save the planet."

—Sam, age 16

"Of course our project is about the planet, but it's really about us and our future. Everyone's future."

—Marty, age 13



"The idea that animals are going extinct, not just because of nature, but because of what we have done to nature—that seems wrong. We can be their voice."
—Klara, age 13

"We think about climate change all the time. It matters in our village every day—whether our crops grow or we have water for irrigation. How can people live without thinking of these things?"
—Kanaan, age 15

"Doing this project made me think in a new way. I hadn't even considered how I wasted water. Now I pay attention, and I tell others."
—Niki, age 12

"The more I found out, the more questions I had. The more we did, the more we wanted to do. We figured out that we need to change the light bulbs we use, and also help change public opinion and policy. This is a big issue, but we are up to the challenge!"
—Belle, age 14

What Do You Know?

If there is a continued rise in global temperatures, what percentage of species may be threatened with extinction by 2050?

- 5% 15% 20% 35%

Which two countries are the largest contributors to climate change—mainly because of their dependence on coal-fired power plants?

- China United States Brazil India

Scientists predict that the North Pole could be ice-free for the first time in recorded history during the summer of what year?

- 2013 2030 2050 2100

Have you noticed? Planet Earth's temperature is on the rise, creating news across the globe. In fact, you may be aware of changes where you live. Or you may hear reports of polar ice caps melting, increased frequency of hurricanes, tornados in unlikely places, and droughts (severe dry spells). But while the idea of climate change may be news, it's not new. For centuries the earth's temperature has been on the rise—just very, very slowly. However, now this temperature rise is increasing at a rate that has scientists, politicians, and many other people all over the globe asking serious questions and recognizing the need for action.

Why should you get involved? All indicators point to humans as the cause for this rapidly rising heat. Simply put, if we make a mess, it's our job to clean it up. You could say, "Let the next person who comes along deal with it." But in reality, that "next person" is you. Many generations before you have contributed to global warming, and your generation will either be a continuing part of the problem . . . or a *big* contributor to the solution! The choice is yours. Which will you choose?

"All doubts have vanished. Climate change is happening and it is caused by man. We have to act."

—Yvo de Boer, executive secretary of the United Nations Framework Convention on Climate Change

Starting Now

However you found this book or it found you, the activities will help you discover ways to address community or global problems. How? By learning how to **investigate**, **prepare**, **act** on your ideas, **reflect** on what you do, and **demonstrate** what you did and how you did it. Whatever you choose to do, whether it's participating in an awareness campaign or starting your own conservation initiative, the time to start is now.

"Each generation has a challenge and an opportunity. This is yours."

—Reid Detchon, executive director of Energy and Climate Division of the United Nations Foundation

Did you get the right answers?

Here are the answers to the questions on page 2: Scientists suspect that up to 35% of Earth's species will be threatened if water levels continue to rise due to climate change. China and the United States are the greatest contributors to the atmospheric conditions that are speeding up climate change. All of the years listed have been included in scientists' predictions about a summer ice-free polar cap—with the suggested possibility of this occurring as early as 2013 coming as a huge surprise.

While these questions had “right” answers, many questions and activities in this book are designed to get you thinking, learning, sharing ideas, and discovering new questions to ask. In these cases, few have “right” answers. Rather, they are opportunities to learn, experience, and get involved.

A Note About Using This Book

This guide is written for use by classes or youth groups, so the activity directions assume you are in a group of around 15 to 30 students. However, smaller groups, families, and individuals can easily adapt every activity. If you are using this book on your own, consider finding a friend to participate with you.

Tips for Using This Book



You are holding a written guide, but you will find other guides around you—adults you meet who are involved in service learning, friends and other students working with you, community members who are eager to help—even people across the globe taking on projects just like yours.

- ★ Keep track of your thoughts and observations in this book. Write in it whenever and wherever you want! (Reflection activities on pages 37–38 are great for ongoing thoughts and feelings that arise.)
- ★ Stay informed about current news involving climate change and global warming by visiting the many Web sites listed in this book and by paying attention to stories in the news.
- ★ How about starting your own service learning journal on reused or recycled paper?
- ★ Share your ideas with others, no matter how far-fetched they might seem!
- ★ Let your creativity inspire you to be an agent of change. Planet Earth needs YOU.

Service + Learning = Service Learning

Service:

Service means contributing or helping to benefit others and the common good.

Learning:

Learning means gaining understanding of a subject or skill through study, instruction, or experience.

Service Learning:

The ideas of service and learning combine to create service learning. **Investigation, preparation, action, reflection, and demonstration** are the five stages of service learning. By understanding how each stage works, you can be more effective in making plans to help in your community.

Stage 1: Investigation

The first stage of service learning is **investigation**. What will you investigate? You'll investigate the resources that your group brings to the process of service learning. You will also investigate the needs in your community related to climate change and global warming that you can do something about.

Create an Inventory of Your Skills and Talents. Do you enjoy photography, writing, or art? Are you a behind-the-scenes organizer, or do you prefer being on stage with a microphone? Throughout service learning, your interests and abilities can be further developed. Investigate each person's skills and talents through paired interviews.

Make a list and keep it visible as you prepare, act on, reflect on, and demonstrate your ideas. This list can be helpful at every stage of your project, as every person has unique value to contribute.

What Community Needs Inspire You? Start a list below and then discuss it with others and let your list grow. Circle the topics that seem to inspire the most people in your group, while still paying attention to ideas that inspire only a few. Put a checkmark by three needs that seem worth addressing. Revisit this list often to see if your interests change as you learn more details about climate change and global warming.

"When you are asked if you can do a job, tell 'em, 'Certainly I can!' Then get busy and find out how to do it."
—Former U.S. President Theodore Roosevelt

_____	_____	_____
_____	_____	_____
_____	_____	_____

Stage 2: Preparation

Imagine that a drought (a severe dry spell) is affecting your community. You investigate the problem and decide to find ways that less water could be used at your school by doing a water audit. What would you do next? **Prepare.** You have experience preparing all the time. You prepare to go to school each school day, by learning lines for a play, or by gathering ingredients to bake cookies. Make a list of three ways you would prepare to do a water audit at your school.

"What we learn to do, we learn by doing."
—Aristotle, philosopher

1.
2.
3.

Now look at the list below. Did you have similar ideas?

- Brainstorm all the ways water is used at school.
- Draw a map of the school and mark places where water use might be reduced.
- Obtain a school water bill, and learn what the different terms mean.
- Interview adults with different roles at school to gather their ideas about water usage.
- Invite a speaker to your school from the water utility company.

Stage 3: Action

Once you have investigated your skills and community needs, and are prepared with the background knowledge you need, you are ready to create and carry out your **action** plan. Most often, you will take action in one or more of the following four ways.

"Life is a big canvas. Throw all the paint on it you can."
—Danny Kaye, actor

Direct Service: 1

Your service involves face-to-face interactions with people or animals, or close contact with them.

Indirect Service: 2

Your action is not seen by the people (or animals) who may benefit from it, but it meets a real need.

Advocacy: 3

What you do makes others aware of an issue and encourages them to take action to change a situation.

Research: 4

You gather and report on information that helps a community.

Which of these ways best describes the effort to reduce water use at school? What if you wanted to address the topic of water conservation using all of these ways? With a partner, come up with an example for each category and write them below.

Taking Action to Conserve Water During a Drought

Direct Service:

Indirect Service:

Advocacy:

Research:

Stage 4: Reflection

What is one piece of information you have learned so far that you want to remember?

.....

What is one idea you now have that you didn't have before you opened this book?

.....

When you answer these questions, you are participating in **reflection**: looking at your experience to determine what it has to do with you. Reflection takes place all along the way: as you investigate and prepare, as you do the service, and as you demonstrate what you have learned and accomplished. You will find reflection built into many of the activities in this book. When you see the Time for Reflection symbol, follow the directions to special reflection pages.

"There are two ways of spreading light—to be the candle or the mirror that reflects it."

—Edith Wharton, author



Stage 5: Demonstration

"To learn is to teach."
—Japanese proverb

With **demonstration** you can again draw upon your abilities to showcase your service learning project. In this final stage, you review what you learned, how you planned, what you did, and how you've reflected along the way. Then, you tell others about it. Circle ways you might want to demonstrate what you accomplish:

Make a mural.

Create a Web site or blog.

Design a comic strip with animal characters.

Write an article for your school or community newspaper.

Build a display for a local library.

Put together a video or audio recording.

Perform a skit for another class or youth group.

Create a brochure showing the steps you followed.

Getting Started: What Does Your Community Need?

The first step in your project is to investigate the needs in your community so you can prepare and make a plan for action. Keep in mind that your “community” can be local, regional, national, or international. Your activity can be one that you and others initiate, or you can join in an activity others have already begun.

Use the questions in the following four categories as guides for learning more about the topic, especially regarding how it affects your local area. If you’re working in a large group, form four smaller groups, with each group focusing on one category and gathering information in a different way.



Media

What media (newspapers, TV stations, Web sites) in your community might have helpful information for you? List ways you can work with different media to learn about climate change and global warming issues in your community.



Interviews

Think of a person who is knowledgeable about climate change and global warming where you live—perhaps someone who works at a service agency, a government office, or a school, or with a nearby college or university. Write questions you would ask this person in an interview.

3

Surveys

A survey can help you find out what people know about climate change and global warming and get ideas for helping. Who could you survey—students, family members, neighbors? How many surveys would you want to have completed? Write three survey questions.

Who to survey:

How many surveys:

Questions for the survey:

- 1.
- 2.
- 3.

4

Observation and Experience

What ways are there to gather information through your own observation and experience? Where would you go? What would you do there? How would you keep track of what you find out?

Next Step: Share your ideas. Make a plan for gathering information in the four ways just discussed. If you are working in small groups, each group may want to involve people in other groups. For example, everyone could help conduct the survey and collect the results. Record the information you learn in the next section, “Our Community Needs.”



Turn to pages 37–38, and choose a reflection activity to complete.

Our Community Needs

What I Learned From . . .



Media:



Interviews:



Surveys:



Observation and Experience:

As a result of your investigation, what do you think are the most important needs in your community involving climate change and global warming?

Which method of gathering information did you like best? Why?

Gathering Facts About Climate Change & Global Warming

What do you want to know about climate change and global warming? Make a list of your questions. Gather facts and teach others by making “What’s the Deal with Global Warming?” fact cards. On one side of the card, print a question. Investigate the answer. On the other side of the card, list a fact you’ve discovered and how it affects a particular part of our world (see categories below). As you “deal” the cards to others, let them add ideas.

Try using recycled or reused paper, cardboard, and greeting cards, or “found” (existing) objects when doing the activities in this book.



Work in groups. Each group begins by selecting one of the following categories: **People, Plants, Animals, Weather, Land & Water, Health, and Food.** For each category, a fact is provided to get you started. What question would this fact answer? Brainstorm additional questions and facts for the category and create your cards.

CATEGORY	FACT	QUESTION
People	During the 1900s, the world population multiplied nearly 4 times—growing from 1.6 billion to 6.1 billion people. However, our carbon emissions multiplied by 12.	
Plants	Plant species are being forced to migrate north to places where they have never been seen before.	

CATEGORY	FACT	QUESTION
Animals	Caribou in western Greenland depend on seasonal vegetation for food and are struggling to find enough to eat.	
Weather	Anticipated droughts could leave up to 250 million Africans short of water.	
Land & Water	Covering over 70% of the planet, oceans hold increasing amounts of heat from the atmosphere, leading to the death of many coral reefs.	
Health	Increased rainfall and warmer climates at higher elevations benefit mosquitoes that carry malaria and other diseases.	
Food	After food is grown, it is packaged and transported, usually traveling over 1,500 miles before being consumed.	

Worldwide Weather Watch

While scientists and politicians may debate the cause of climbing temperatures, there is overwhelming agreement that global warming is a fact. And climate changes are occurring in some parts of the world faster than predicted. This is especially true in the Arctic, where ice caps are melting at an alarming rate. So what does that have to do with you? For one thing, as the ice melts and Arctic water levels rise, low-lying cities such as Shanghai, China, or New York City could seriously flood. Millions of people could be displaced, and the landscape of the world would change dramatically. Here are other ways warmer weather alters our world:

More heat waves = elderly people and people who live in hot places without air conditioning experience heatstroke

Flooding of rivers = overflow of sewage systems = increased spread of disease

Droughts and lack of rainfall = limited water supply + more wildfires + more air pollution

Intense hurricanes = damaged buildings and roads + contaminated food and water

Scorching summers, warmer winters = death of plant and animal life = interrupted food and medicine production + less plant-based gases that make Earth inhabitable

A Community Story: Flood and Ice

In one year's time, communities in northeastern Oklahoma faced unprecedented weather—two ice storms and a flood. Students took action to tell their story. A journalism class created a newspaper devoted to students whose lives were affected by the disasters. History classes conducted surveys, English classes wrote poetry, art classes produced posters, and civics classes wrote essays. With community support, the students collected their stories—in images, photos, and writings—in *Disasters: Flood and Ice*, a book that truly gives voice to the community.

"We had over five feet of water damage. We got 'red tagged,' which means you can't rebuild or move back in. We lost our most prized possession, our home."

—Brianna, age 14

YOUR TURN

Has your community ever experienced ice storms or floods? How about wildfires, droughts, hurricanes, or tornados? Write about the climate change you see happening in your own neighborhood.

The Web site Save Our Seas has resources and information designed for teens. Visit www.sosteens.com and click on the tabs to learn about global impact on many natural resources, including the water our planet needs to support all life.



Turn to pages 37–38, and choose a reflection activity to complete.

Where in the World Is Global Warming?

Check out these places where global warming is taking its toll. For each, determine the potential cause and the resulting impact. For the three blank boxes on the map, research each area and describe the causes and impacts of global warming there.

Lake Superior Becoming Inferior

The world's largest freshwater lake is heating and shrinking. Winter ice cover once reflected sunlight into space. Now, rising temperatures place animals and plants at risk. Boats and ships are restricted.

A Warm Arctic?

With warmer winters, earlier springs, and longer, hotter summers, large lakes are replacing ponds, animals are moving in from the south, and plants never seen in the area are growing.

Costa Rican Forest Growing Frogless

An estimated 165 amphibian species have disappeared in the Monteverde Cloud Forest due to a drying climate. Rising ocean temperatures result in less rainfall. Amphibians support the entire food chain by transferring matter between land and water.

Brazil's Energy in Jeopardy

Brazil derives 45% of its energy from renewable sources. Climate change could affect its wind power, production of oil-producing crops, and power stations that rely on rainfall. This will greatly impact the economy.

Antarctica Melting

A 220-square-mile ice shelf has collapsed into the ocean! Changes in Polar Regions affect sea levels and climate patterns across the globe. Freshwater ice melting in a saltwater ocean alters water chemistry, harming ocean animals.



Europe's Monuments Threatened
 The Tower of London and Venice's famous canals are in danger of destruction due to flooding. Unstable weather puts monuments at risk around the world, as governments struggle to protect them.

Siberian Tundra Spewing Gases
 About 386,000 square miles of permafrost is melting. This formerly frozen subsoil could release up to 70 billion tons of harmful methane gas into the atmosphere.

China in Crisis
 Over 300 million people have endured flash floods, landslides, drought, and water shortage due to climate change.

Illness in Indonesia
 Climate change has shortened the birth cycle of malaria-carrying mosquitoes. Two-thirds of the country is at risk for epidemics. Longer droughts and sudden floods will disrupt food production and increase illness.

Floods & Droughts in Egypt
 Rising sea levels along the Nile River delta may force millions of people to move inland. With many inland regions plagued by drought, where can they go?

Kilimanjaro Losing Its Cap
 Africa's highest mountain has lost 82 percent of its ice cap since 1912; one-third vanished in just the last 15 years. Scientists estimate the ice could be completely gone by 2020.

Great Barrier Reef Dying
 Scientists suggest that 95% of the reef's living coral could die by 2050 if ocean temperatures rise as predicted. If so, countless other sea creatures will also be lost.

YOUR TURN

These locations are just a small part of the climate change and global warming story. Using this map as a model, create your own world map for your class or school, as a publication, or for a series of public service announcements.

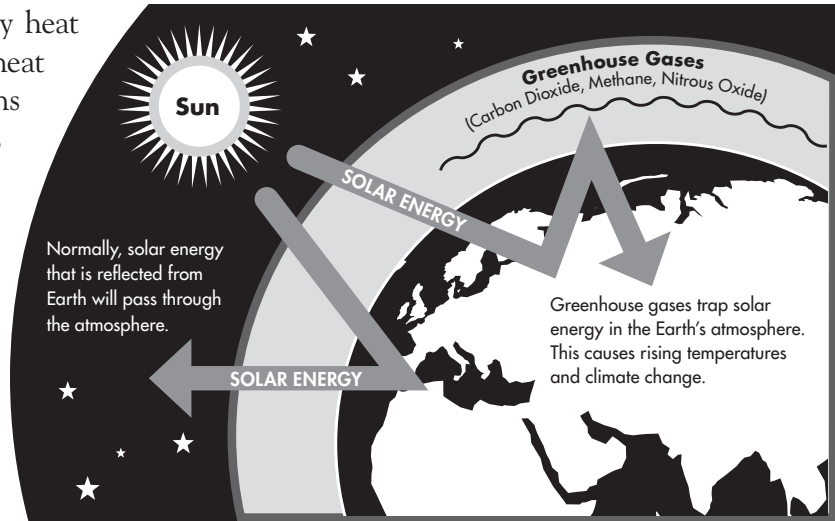
What's Causing All This Heat?

We all know the sun is our primary heat source. However, when the sun's heat reaches our atmosphere, what happens next is critical. Some of the heat is absorbed by the planet. And Earth reflects much of the sun's energy back. When too much energy stays, our planet heats up.

Three gases contribute to this heat being trapped in what is called a "greenhouse effect": carbon dioxide, methane, and nitrous oxide.

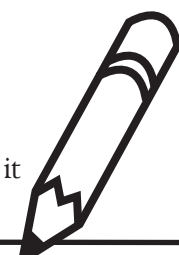
These "greenhouse gases" have always been part of Earth's atmosphere, but recently the amounts of these gases have increased, causing concern. What is the primary cause of the increase? We are. Humans have pumped these gases into the air with our cars, factories, and even with the cows we raise for meat.

Students at the American International School of Johannesburg, South Africa, studied climate change. Their assignment: create a comic strip that explains climate change and shows other teens what they can do to help the planet.



YOUR TURN

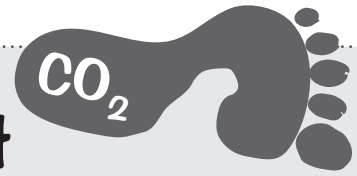
Below are steps to create your own comic strip. Begin your comic strip now and add to it as you learn more about climate change and come up with ideas for action.



Step 1: Create your main characters. What do they know about climate change? Who are they explaining these facts to?

Step 2: Draw a picture of what you think climate change looks like and what contributes to it.

Step 3: Draw your plan for action.



Find Your Carbon Footprint

At the beach, your footprint in the sand can be washed away by a wave. Your carbon footprint—your impact on the atmosphere—is not washed away so quickly. Carbon dioxide (CO₂) makes up about half of Earth’s greenhouse gases. Our daily actions release CO₂ (and other gases), which contributes to global warming. But *one* person’s carbon footprint can’t really amount to that much . . . can it?

Walking Wednesdays

At Denton Creek Elementary in Coppell, Texas, fifth graders formed groups to find out their carbon footprints. By doing Internet research, they measured the approximate amount of CO₂ they released into the atmosphere as a result of their daily activities, and how that CO₂ impacted the earth. They discovered an astonishing fact: to have enough natural resources for the whole world to live as they lived day-to-day, there would need to be about *six* Earths! So the students took action. They improved their recycling program, discussed food waste on a school news program, and started “Walking Wednesdays”—asking students and their families to walk (or bike) to school or work. Then, they held a student assembly to teach the entire school and visiting parents about reducing their carbon footprints.

International Walk to School Month is held in October each year to promote physical activity and environmental awareness. In 2007, a record 42 countries participated in events, and new countries are joining all the time. Go here to see how you can join: www.iwalktoschool.org.

Are You a Carbon Litterbug?

While you might not throw your trash on the street, are you a *carbon* litterbug? Are you careless about the amount of CO₂ you release into the atmosphere? Find your own carbon footprint by visiting www.globalfootprints.org or www.myfootprint.org/en. Once you calculate it, make a list in the chart below of changes you can make to reduce your footprint. Some will be easy changes (like unplugging your computer at night) . . . and others might be a little harder (like growing all your own food).

Easy changes	Hard changes

Place a checkmark by the changes you plan to do. Then, find a “carbon footprint buddy” and share your plans. Check back with each other periodically to see how much you’ve reduced your footprints. Also, refer to this chart as you make your action plan!

If I Only Knew . . .

Many people have no idea that their carbon footprint can contribute to climate change. How can you inform people? On your own or in small groups, brainstorm ways to calculate the carbon footprints of people you know, inform individuals of their carbon footprints, and inform your group or community of your total carbon footprint.

Complete the chart below, then share your ideas with others. (Some ideas are included to get you started.) As more people reduce their carbon footprints across the globe, their individual actions can add up to a giant benefit to our planet.

How will I calculate footprints?	How will I inform individuals?	How will I inform my group or community?
<i>Create a survey that helps you find the footprint of people you know.</i>	<i>Design greetings cards that provide people with their footprints and list ways they can reduce them.</i>	



Turn to pages 37–38, and choose a reflection activity to complete.

Fuel for Thought

Coal, oil, and natural gas are called fossil fuels because they've been under the earth's surface as long as dinosaur fossils, and many even longer. Now we find and use these fuels to power factories, cars, and airplanes, and to heat our homes, schools, and businesses. In the process, the fuels produce 90 percent of the carbon dioxide that is causing an imbalance in our atmosphere. When we add deforestation (cutting down forests), mining, and other activities, our problems increase even more.



Together, humans use 150,000 liters—about 40,000 gallons—of oil every second.

Your Turn

Now, new ideas for powering up are all the rage—from windmills to ethanol and even to algae! What exactly are these new fuel options, and how do they compare to fossil fuels? Are some of these options dependent on where you live? Choose an alternative energy option from the following list. Determine its pros and cons. Become an expert and teach others what you find out by using these methods:

- Present facts from at least two different sources.
- Express information creatively through visual art, poetry, or music.
- Write a recommendation on whether this is a good option for your community.

Wind power

Solar power

Nuclear energy

Biodiesel (fuel made from vegetables and plants such as algae)

Hydropower

Tidal energy

Geothermal energy

Wood

Garbage/landfill gas

Ethanol (alcohol made from grains like corn and wheat)

Hydrogen

Visit the Energy Information Administration's Kid's Page at www.eia.doe.gov/kids for more details about these fuel sources.

Food or Fuel?

Cornfields that once provided food for your dinner table or grain for cattle are now being used to make ethanol fuel. Is this a good idea, or should edible crops like corn be saved to meet nutritional needs, especially with growing hunger throughout the world? Study both sides of this issue. Then, debate with others.



What is **kudzu**? If you live in the southeastern United States, you are probably familiar with this fast-growing plant that is being considered as a new source for ethanol. What other fast-growing plants do you think might work?

An Energy Garden

As part of a Roots & Shoots group project, the Sandy Springs Friends School in Sandy Springs, Maryland, grew energy from the ground up. The students transformed a quarter-acre plot of land into a field of *peredovik*, or “black oil” sunflowers, to be converted into biodiesel. They tend to the garden, remove the seeds from the flower heads, and press and grind the seeds into valuable oil. Students also use the garden to educate others about organic farming, native crops, and alternative fuels.

For more information about Roots & Shoots and how you can get involved in a project, visit www.rootsandshoots.org.

Have You Seen the Veggie Van?

Of the roughly 450,000 school buses in America, about 390,000 are diesel-powered. Diesel exhaust seeps inside the buses through the bus windows and kids breathe in the toxic fumes. Biofuel (a.k.a. “veggie fuel”) can work in diesel buses and provide cleaner air for passengers and the outside world. If you ride a diesel-powered bus to school, how about leading a school campaign to convert it into a “veggie van”? Visit www.veggievan.org and www.biofuels4schools.org to find out how schools are changing fuels.



YOUR TURN

Imagine if your class received this letter:

Dear Students,

We need your ideas! We want teachers and students to arrive safely and easily to school. Can you offer suggestions for how to reduce the number of cars and buses we use every day? Would the plan change depending on the season and weather? We also want to promote health and fitness in our community. Can your ideas also consider ways that we can be more physically fit?

Sincerely,

Your School Principal

How would you respond?



Meet Kids in Action: Part 1

Community Conservation

The Fayette Academy Ecology Club in Somerville, Tennessee, is educating its community about energy conservation. Students in the club used money from recycling projects, grants, and donations to purchase over 2,000 compact fluorescent light bulbs and distribute them to individuals and organizations. They presented an energy conservation program to the City Board of Commissioners, convinced their school board to adopt its first ever energy policy, and inspired the Police Chief to audit the police department's energy usage. They set up recycling containers at sporting events and are working to provide biodiesel for school buses—all in an effort to reduce their school's energy consumption by 40 percent. The club is also cooperating with local government officials to help identify ways to promote energy conservation in the city's government buildings. For their contribution, they were named the 2008 National School of the Year for NEED—the National Energy Education Development Project.

Find out more about NEED at www.need.org, and by visiting Teens for Planet Earth at www.teensforplanetearth.org.

Youth Summits Around the Globe

Youth summits are events that bring young people from all parts of the world together to discuss what is happening with the climate now, and how we can anticipate the possible results of global warming in the future.

- The 2008 Youth Summit sponsored by the United Nations Foundation gathered kids from eight countries to learn about key issues from experts, strengthen their leadership skills, and conduct a service project on the streets of New York City.
- The 2008 Youth Eco-Forum was hosted by St. Dominic's International School in Lisbon, Portugal. There, students examined four key issues: managing climate change, managing ocean coastline, population growth, and deforestation. Then, they developed ideas into plans for action.

"Each light bulb replaced in our community will reduce CO₂ emissions by 600 pounds a year. Our hope is that others in our community will see the economic advantages, as well as the environmental ones. This is something that every family can do, too."

—Savannah, age 15

Your Turn

Is there a youth summit held near you? If not, what steps could your class take to hold one in your community? What would be your key issues? What experts could provide you with information? What leadership skills would you want to develop? What projects could you do together?

What's Food Got to Do with It?

Is there a connection between the food we eat and global warming? Before reading further, brainstorm as many connections as you can.

Did you come up with any of these?

- Fertilizer used on crops releases nitrous oxide, a greenhouse gas.
- Machinery used to harvest food produces carbon dioxide.
- Refrigerating food consumes energy.
- Transporting food uses fuel.
- Food containers and waste are dumped in landfills that pollute the ground, water, and air.
- Animals like cows that are raised for meat produce **nearly 20 percent** of the greenhouse gases in our atmosphere while passing gas.

YOUR TURN

Find your “foodprint” at www.coolfoodscampaign.org. Record how each of the following activities makes global warming better or worse:

Eating food grown organically (without pesticides): _____

Buying a product made from an animal (meat, dairy, leather, fur, etc.): _____

Eating food that has been processed in a large factory: _____

Consuming food that has been transported to you from a faraway country: _____

Buying food contained in lots of packaging: _____

Become a “Cool Food Advocate.” Here are some ideas to get you started:

- Educate others about buying foods grown closer to their homes and that use less packaging.
- Ask your local market to post the miles a food has traveled to reach it. (Could you help make the signs?)
- Advocate for local produce to be used in your school’s cafeteria.
- Create a school garden where kids can grow their own vegetables and fruit to eat.
- Write a cookbook with recipes for meals made from earth-friendly foods, and photocopy it for others on reused paper or post recipes online.



Meet Kids in Action: Part 2

Plant a Tree . . . or 100 Million

On September 22, 2008, students in 122 countries across the globe—from Canada to Finland to Malaysia—all did one simple thing: *They planted trees.* Why? In addition to reducing greenhouse gases, trees prevent soil erosion and protect coastal areas from tropical storms. These students are part of the 100 Million Trees by 2017 campaign led by ENO (Environment Online), which holds an international tree-planting day every September.

Learn about the ENO campaign at www.enotreeday.net. You can also help plant a *billion* trees through the United Nations Billion Tree Campaign at www.unep.org/billiontreecampaign.

“Plant trees. They give us our two most crucial elements for our survival: oxygen and books.”

—A. Whitney Brown, author

Audit Your School

At Washington West Supervisory Union in Vermont, civics students conducted a school energy audit to find out how their school could use less energy. From the results of their audit,

they recommended their school replace 1,600 fluorescent light bulbs with energy-efficient bulbs, and install motion-detector switches on the lights. They estimated these acts alone would save the school and the city’s taxpayers roughly \$10,000 a year in energy and maintenance costs, and reduce carbon emissions by 122,000 pounds. The students made a presentation to their school boards, and the response was a resounding “Yes!”

To learn about conducting a school energy audit, visit Earth Team, an environmental network for teens, teachers, and youth leaders at www.earthteam.net.

What’s Cookin’?

The students at Miami Country Day School have made every day “World Environment Day” by combining solar power and recycling efforts to help the planet. They use recycled materials to build sun-powered ovens and provide them to developing countries. Over 2 billion people around the world rely on wood, charcoal, or dung (animal feces) for fuel—all of which release greenhouse gases. A recycled solar cooker can save natural resources and eliminate *tons* of carbon dioxide emissions from the atmosphere.

“The most expensive thing we can do is nothing.”

—Harvey Ruvlin, chairman,
Miami-Dade County Task Force

Learn more about this project and World Environment Day at www.cyberschoolbus.un.org.

Looking Back: Historical Moments & Actions



How has climate affected history? How have humans influenced climate changes? Think of two historical events that show the interaction between forces of climate and weather and the actions of people.

When in history?	Who was affected?	What happened?

The Birth of Environmentalism

Below is a list of famous environmentalists throughout history. Draw arrows to match each person with their correct contribution. One has been filled in to get you started.

Person	Contribution
Aristotle	Pioneered the movement toward renewable energy systems
Alice Hamilton	Knew that deforestation caused erosion
John Muir	Fought to preserve wilderness areas
Wangari Maathai	Began Roots & Shoots to engage youth in protecting the environment
Henry David Thoreau	Opposed water pollution in Philadelphia
Marjory Stoneman Douglas	Won a Nobel Peace Prize for tree planting in Africa
Anthony van Leeuwenhoek	Signed a law protecting Yellowstone National Park from loggers
Abraham Lincoln	Wrote about living in harmony with nature
Benjamin Franklin	Doctor and proponent of alternatives to leaded gasoline
Chico Mendes	Biologist and author of the book <i>Silent Spring</i> , which helped spur the environmental movement
Rachel Carson	Amazon activist who raised awareness of the destruction of the rain forest
Jane Goodall	Transformed the Florida Everglades from “swamp” to valuable resource
George Washington Carver	Invented the microscope, allowing scientists to analyze microorganisms

Make a timeline of these influential people. How does each person’s contribution affect today’s world? Select one person and write a brief biography. Transform these into “living biographies”—bringing the people to life through performance. Keep in mind that one big thinker or inventor rarely acts alone!

“If I have seen further it is by standing on the shoulders of giants.”
—Sir Isaac Newton, scientist

Is the Industrial Revolution Still Happening?

The Industrial Revolution began in Great Britain in the mid-1700s, spurred on by the idea of a man named Edward Cartwright. After visiting a factory, Cartwright developed machines to manufacture clothes at record speeds. This idea opened possibilities of increasing productivity using fossil fuels, including: transporting people and goods on trains powered by steam engines, operating automobiles with oil-burning engines, and using electric refrigerators and freezers to keep food fresh longer. These conveniences only made us want more . . . and more. Our dependency on fossil fuels may have improved aspects of our lives, but at a cost.

View a global environmental history timeline at:
www.runet.edu/~wkovarik/envhist.

YOUR TURN

How is the Industrial Revolution continuing to evolve? Are some countries still catching up? Every major event in history had many contributors. How did chopping down forests in England, France, and Germany during the mid-1500s to 1600s contribute to the Industrial Revolution? Which fossil fuel did humans use first: oil, natural gas, or coal?

International Climate Change Policy

Climate change was a top agenda item for 2008's G-8 summit—a gathering of leaders from eight industrialized nations: the United States, Japan, Germany, Britain, France, Canada, Italy, and Russia. There was some progress, yet much disagreement over targets for greenhouse gas reductions, and how much developing countries such as China and India should be required to participate.

YOUR TURN

Form three groups, each choosing to represent one of these perspectives in a debate.

1. Industrialized nations wanting to cut greenhouse gas emissions by 50 percent by 2020.
2. Industrialized nations wanting to cut greenhouse gas emissions by 50 percent by 2050.
3. Representatives from China and India (who were not at the G-8 summit). These two countries have the largest populations, are less developed, have great energy needs, and are more reliant on fossil fuels than the other countries.

What policy will you recommend? Can you come to a consensus (agreement) among all participants? Developing a policy requires research, partnerships, and recommendations that have attainable outcomes. Funding and other resources can be also suggested. As you plan your service learning project, might it include developing a policy for climate change on the school, city, state, national, or international level?



Making History with the Inventive Spirit

"We need to reinvent the wheel, not because we need a lot of wheels, but because we need a lot of inventors."

—Bruce Joyce, author and educator

Got new ideas for planet Earth? That's what we need! Finding alternative sources for energy is one big idea being explored by governments, corporations, and creative individuals everywhere.

Are You Thinking BIG?

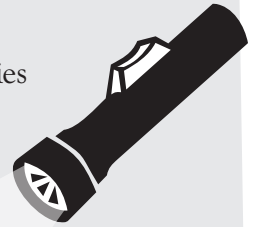
Elizabeth Redmond, age 24, is a big thinker. What does she think about? How our bodies emit 100 watts of power, even when we are resting. That's enough to power a computer! What is Elizabeth's idea? To create floor tiles in places with high people traffic that capture human energy and turn it into electricity. Her idea is called POWERleap.

What do you think? What would be the challenges? What ideas do you have to harness people power?

Are You Thinking BRIGHT?

Tony Cervone of Green Energies Workshops has a bright idea: Use simple materials to create a "light in a bottle" to assist people in the world who live without electricity. He calls it a *Taa Bora* (Swahili for "better light"). The design calls for items easily found even in underdeveloped countries: empty plastic soda bottles, paper clips, and rope straps. A small portable solar energy panel provides the power. A single charge can keep a *Taa Bora* lit for three days as a lamp, and up to a week as a flashlight.

How would having electricity affect the way children in these countries learn? Could a simple light affect a community's health?



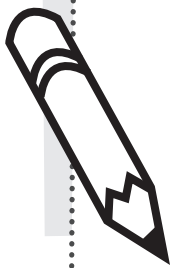
For more information, visit www.kidslightingafrica.com.

Your Turn

Consider these power-full inventions:

- Headlights for bicyclists that are powered by pedaling
- Backpacks that convert energy generated from walking into energy that charges cell phones and MP3 players

What's your idea? Put on your inventor's cap, identify a need, and create an answer that requires minimal resources . . . and delivers maximum results!



Learning from Reading:

Arctic Tale



Books can help you learn about situations you've never experienced and place you in environments that seem extraordinary. The story presented in *Arctic Tale*, a companion text to the movie of the same name, provides us with a look at life from the perspective of the polar bear, Nanu, and her family.

If you are working in a large group, form groups of four to read and discuss the excerpt from *Arctic Tale* on page 30. Assign each person in the group one of the “connector” roles below. Each connector’s job is to lead a group discussion about the story from a specific point of view. He or she asks the questions listed (along with others that come to mind) and encourages group members to respond. Choose one person to read the story aloud to the rest of the group. Feel free to write notes and ideas in the Literature Circle on the following page. If you are working alone, consider the questions under each connector and give your own answers.

Personal Connector:

Ask questions that connect the story to group members’ experiences, such as:

1. What thoughts or feelings does this story inspire in you?
2. The animals’ expectation of what is to occur doesn’t take place due to changes beyond their control. What similar situations have you or others been in within your community? What happened?
3. How can people help others in similar situations?

Literary Connector:

Ask questions that connect this story to stories group members have read in a book or newspaper, or seen in a film, such as:

1. While this story has animals as main characters, what stories have humans in a similar situation?
2. How can media effectively use the stories of animals and their challenges to teach important information?
3. In some media, animals are personified with human voices and traits. What might Nanu say if she could speak?

Service Connector:

Ask questions that connect this story to ideas for service projects, such as:

1. What needs to be fixed in this situation?
2. What service activities do you think of when you read this story?
3. Discuss how you and others could participate in direct service, indirect service, advocacy, or research to affect this situation. (Refer to page 5 for details.)

Learning Connector:

Ask questions that connect this story to learning opportunities, such as:

1. What information would be helpful to know about this situation?
2. What questions do you now have about climate change and global warming?
3. What do you think people your age would learn from reading this story?

Literature Circle for *Arctic Tale*

Personal Connector

Literary Connector

Service Connector

Learning Connector



An Excerpt from *Arctic Tale*

Springtime, when the ringed seals are plentiful, is prime hunting season for polar bears. During these months, polar bears fatten up for the summer when the pack ice disappears and seals become much harder to catch.

The sun stays in the sky for more and more hours of the day, until night disappears altogether.

The sun never rises very high in the sky, however. It stays just above the horizon, traveling in a great circle all the way around every 24 hours. Relative to the winter, the Arctic summer is balmy. Temperatures climb above freezing, at times reaching above 50 degrees Fahrenheit (10 degrees Celsius).

The sun heats the seawater, causing microscopic algae to bloom. With the algae comes an explosion of life—jellyfish, shrimp, plankton—that feed on the plants. These creatures in turn draw larger animals that have migrated north to join in the summer feast—fish such as herring and salmon, birds such as the arctic tern and the snowy owl, bowhead whales, harbor porpoises, orcas. The ocean and the sky teem with life.

With the coming of summer, the pack ice breaks up. With loud snaps and booms, cracks appear in the surface of the ice. Huge sections of the sheet heave and shudder, as the seawater underneath lifts and shifts them about.

Nanu and her family wait out the warm summer months, unable to catch seals without the hard pack ice but trusting that with autumn the ice will return.

The days soon get shorter. By the time the fall comes, the sun is in the sky for only 12 hours a day, and even at noon it is barely above the horizon. Temperatures start to drop, and the ice

begins to re-form, starting from the rock coast and spreading into the open water.

The temperature has fallen, but not as much as in previous years. The ice sheet is thinner, and it doesn't reach as far out into the ocean, either. Nanu's mother has lived through a dozen previous autumns, but she's never seen the ice so meager.

Without a thick layer of ice, the ringed seals won't make their breathing holes and burrows. No ringed seals means no food.

For Nanu and her family, the summer fast has turned into a fall fast. Luckily, polar bears can enter a sort of "walking hibernation," in which their body functions slow down.

Due to global climate changes caused by release of carbon dioxide gas into the atmosphere, summer sea ice in the Arctic has declined by 30 percent over the last half century. Temperatures in different parts of the Arctic have risen three to five degrees. The last time the Arctic was so warm was 125,000 years ago—before polar bears had evolved into a distinct species from brown bears. The best computer models estimate that if current trends continue, by the end of this century temperatures will rise another eight degrees. Pack ice will be a thing of the past. So might the polar bear.

All across the arctic, plants and animals wake anew each spring. Foxes, seals, and murre. Sedges, mosses, and grasses. Whales and narwhals, mice and squirrels. Even clams and blackflies. All form part of the complex, interdependent web of life, as they have for thousands of years.

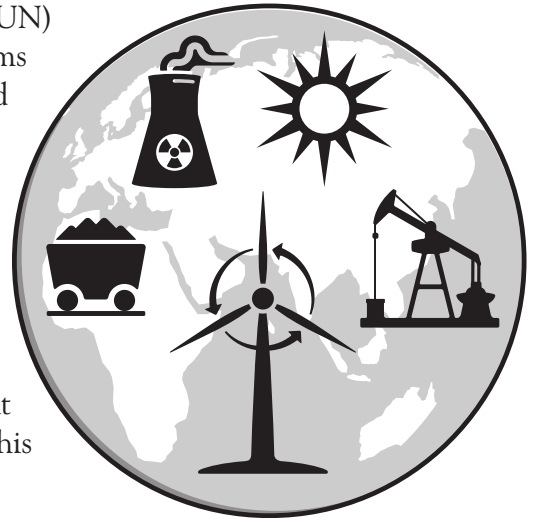
Their fates are forever tied to the shifting rhythms of the ice that defines them, to the blanket of cold that keeps this kingdom theirs.

A Call to Action

Following is a message from Reid Detchon, executive director of Energy and Climate Division of the United Nations Foundation.

“Climate change is a global problem. At the United Nations (UN) Foundation we work on problems without passports—problems that transcend national boundaries. In 1988, the UN created the Intergovernmental Panel on Climate Change to convene world scientists and report to public officials about the progressing danger. This group won the Nobel Peace Prize with Vice President Al Gore.

“Young people are aware of the problem. Al Gore’s movie *An Inconvenient Truth* and extensive media coverage inform us that our world is changing in ways we won’t like. It will take at least 50 years to shift how we produce and consume energy. This is a project of a lifetime.



“Anyone in school can spend a career solving the problems we have created—careers in renewable energy and energy efficiency. Biologists, economists, social scientists, doctors . . . every field will be affected by climate change. We face an enormous challenge to make it right, and an enormous opportunity to create a healthier, safer, more secure, and more prosperous world.”

—Reid Detchon, executive director of Energy and Climate Division of the United Nations Foundation

“What are key concerns? The global temperature ranges are moving northward by 30 miles per decade. As temperature ranges move, so do plants and animals. A warmer earth evaporates more water. Some areas get dryer. Storms get more intense. While it may be impossible to attribute Hurricane Katrina or the flooding in the central United States directly to global warming, these extremes will become more frequent and intense with climate change. We are losing polar ice. The North Pole will likely be ice-free in summer in the next several years. If Greenland’s ice sheet melts, sea levels will rise 20 feet. Florida’s Lake Okeechobee and much of Louisiana’s bayou would be gone. This is irreversible change.

In 2007, lack of rain in central Florida caused Lake Okeechobee, the second largest body of fresh water in the United States, to catch fire.

“Rising sea levels and changing rainfall patterns will displace people. As people move, conflict is possible. Climate change is one underlying cause of the crisis in Darfur: when rains stopped, herders moved their cattle to farmland for grazing. Disputes between herders and farmers started the deadly conflict.

An average car contributes about 12,000 pounds of carbon dioxide to our atmosphere annually. A hybrid car can reduce this amount to 3,500 pounds.

“We created this mess, and we can clean it up by making changes in our lives. These changes are not a matter of doing without, but doing *better* with what we have. We can harness the ample renewable energy from rain, sun, and river and ocean currents to meet global needs. We can move from coal, oil, and natural gas to cleaner fuels that return us to balance with nature. Technologies are ready and developing. In a few years, we can all drive plug-in hybrids that recharge with ordinary power cords. Every way we produce and consume energy can change for the better.

“Where to begin? Waste less energy! Probably half of the energy used in the United States is wasted. A phone charger plugged in 24 hours a day uses energy even when the battery is full. Idle TVs use energy. So turn off all power cords when not in use. Change light bulbs to compact fluorescent bulbs. Rather than buy water in a throwaway plastic bottle shipped by truck to a store where you pick it up in a car, fill a reusable bottle with tap water from your faucet! And walk to the store instead of asking your parents to drive you.

“Our combined personal daily actions make a big impact. However, the most important thing you can do is to express your concerns about climate change to public officials, political candidates, and parents and teachers. Ask questions such as: ‘What steps are you taking?’ ‘Is school energy efficient?’ ‘Could we use renewable energy?’

“Right now, global warming is the biggest threat to the world’s poorest people who rely on weather, land, and sea for their livelihood. In Peru’s highlands, people depend on water from mountain glaciers in the dry season. As these glaciers disappear in our lifetime, the people will have to move. African farmers don’t have ample rainfall, monsoons in India are taking a toll, and Alaska’s coast is eroding. With people around the world affected by global warming, each light bulb and walk to the store can help these people. When I was growing up, my parents said, ‘Finish your meal—think of all the starving people in China.’ Now, we can say, ‘Turn off your light—think of all the starving people in Africa.’

“Each generation has a challenge and an opportunity. This is yours.”

Compact fluorescent light (CFL) bulbs last seven to ten times longer and use 75% less electricity than regular bulbs. When all U.S. families switch, we will reduce carbon dioxide emissions by more than 90 billion pounds.



Turn to pages 37–38, and choose a reflection activity to complete.

Taking Action

This is your tool to begin making plans for action. (If you are in a large group, work together in small groups on this task.) Start by selecting the community need you want to address. Is this need in your school? Neighborhood? Country? Around the world? Then, go to Step 1.

1 Step 1: Think about the needs in your community involving climate change and global warming. Make a list.

2 Step 2: Identify what you already know. Select one community need from your list:

- What is the cause?
- Who is helping?

3 Step 3: Find out more.

- What else do we want to know about this community need and the ways we can help?
- How can we find out what we want to know?

4 Step 4: Plan for action.

- To help our community, we will:
- To make this happen, we will take on these responsibilities:

Who	will do what	by when?	Resources needed

Service Learning Proposal

Use the information from the previous “Taking Action” section to develop a written proposal of your plan. You can give this proposal to others in your school or organization and to other people or groups who plan to work with you.

Student names:

Teacher/Adult leader:

School/Organization:

Address:

Phone: Fax: Email:

Project name:

Need—Why this plan is needed:

Purpose—How this plan will help:

Participation—Who will help, and what they will do:

Students:

Teachers:

Other adults:

Organizations or groups:

Outcomes—What we expect to happen as the result of our work:

How we will check outcomes—What evidence we will collect and how we will use it:

Resources—What we need to get the job done, such as supplies:

Signatures:

Project Promotion: Finding Resources & Telling Your Story



Now that you have an action plan and a proposal, you are ready to promote your project. Write ways you can do so in each category listed below. In the Follow-Up section, decide who will do what needs to be done. If you are working in a large group, form six smaller groups and have each group focus on a category. After you come up with ideas for your category, present your suggestions.

Donations: What is needed for your project (such as flyers, T-shirts, or food)? Who might donate items?

Fund-raising ideas and resources:
Be creative and invite community support.

Evidence: Chart your progress for others to see.

Media madness: Press releases, radio spots, cable access TV, Web sites—get the word out!

Presentation opportunities: Consider school and community events, like council meetings.

Partners in the community: Brainstorm all possible partners—even unusual ones.

Follow-Up

Roles and responsibilities: Who will do what?



Turn to pages 37–38, and choose a reflection activity to complete.

Make Your Action Memorable

As you put your plan into action, use this page as a scrapbook to record what happens. Add art and photos or glue in a newspaper article.

What happened today?

One page may not be enough. You may want to keep your own service learning journal in a notebook or start a large scrapbook for the entire group to use. Be sure to use recycled materials!



Any new bright ideas to help the project be even better?



Capture the moment! Add a photo or drawing of what you did or saw.

Pause, Look Back, & Reflect



Do you sometimes press the pause button on a remote control? Reflection is like that—a chance to pause and think about your experience from many angles. Sometimes the action in service learning occurs in a day, sometimes it extends over weeks or months. No matter how long your service learning experience lasts, these pages will help you reflect on what you've done. Write the date next to each reflection activity to help you remember the sequence you followed to pause, look back, and reflect.

Date:

What was important about today's activity? How did you contribute?

Date:

Consider this quote by scientist Paul Ehrlich: "The fluttering of a butterfly's wings can affect climate changes on the other side of the planet." What do you think he means by this? Express your thoughts with words and images.

Date:

What have you discovered about yourself—a new talent, a way you generated a new idea, or something you offered to help others?

Date:

Many people are thinking about climate change. Who would you most want to meet and talk with about this topic? Write the conversation you would like to have with this person.

Date:

Imagine Earth feeling better. Imagine it recovering from global warming. What images come to mind? Combine words with images to create a visual representation of Earth being cared for.



Once You Know It, Show It!

You've put your plan into action and seen the results. Now it's time for demonstration—the stage where you show others what you've learned about climate change and global warming, how you learned it, and what you've contributed to the community. This demonstration of your service learning can take any form you like: letter, article, video, pamphlet, artistic display, performance, or PowerPoint presentation.

To help you make the most of your demonstration, answer these questions:

Who is your audience?

What do you most want to tell them about what you've learned?

What do you most want to tell them about how you provided service?

Are there any community partners who you might like to participate in the demonstration?

What form of demonstration would you like to use?



On a separate sheet of paper, write your plan for demonstration.

If you are part of a class or youth group, share your ideas for demonstration with the others you're working with. How can you best use each person's talents and skills as part of your demonstration?

What You've Learned & Accomplished

Take time to think about what you have learned, the service you provided, and the process you used—how you made everything happen. On your own, answer the following questions. Discuss your responses with the people involved in your service learning project.

Learning

What information did you learn in preparing to do service?

What skills did you develop through the activities?

How did this experience help you better understand climate change and global warming?

How can you apply your research skills to other subjects you want to know about?

What did you learn about yourself?

What did you learn about working with others?

What did you learn about your community?

How will you use what you learned in this experience?

Service

What need was met by your service project?

What contribution did you make?

How did your service affect the community?

Process

How did you help with project planning?

What decisions did you make? How did you solve problems?

What differences were there between your project proposal and what actually happened?

What ideas do you have for improving any part of your project?

What do you think is the best part about service learning? Why?

What's Next?

Congratulations! You have completed this service learning workbook on climate change and global warming. However, this is only the beginning. You may want to find ways to stay actively involved with helping in your community, and continue to apply your talents, skills, and knowledge to creating a healthier planet. This final activity will help you determine what's next.

Write a few sentences about what you would like to see happen in your community.



What ideas in this workbook can you use to help make your community a better place?

On each step, write one thing you can do to stay involved in service.

A 3D illustration of a staircase with four steps, ascending from left to right. The steps are light gray with black outlines. To the right of the staircase, there are four horizontal lines, each corresponding to a step, intended for writing. The lines are solid at the top and bottom, with a dotted line in the middle of each step's length.

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FYI (For Your Information)

The Internet

Global Warming: Early Warning Signs has a unique interactive map that gives an up-to-date view of the impact global warming has all around the world. Visit www.climatehotmap.org.

Global Warming Kids is a project of Climate Change Education. Find streaming videos, books, movies, games, science fair projects, and tons of links to climate change Web sites spanning the globe at www.globalwarmingkids.net.

The Green Squad of the National Resource Defense Council at www.nrdc.org/greensquad has guidance from teens around the country on how to turn your school green. Also visit www.nrdc.org regularly for current information on climate change issues.

National Geographic offers The Green Guide at www.thegreenguide.com, which is filled with simple, useful ideas for going green. Sign up for the monthly newsletter and locate green restaurants, shops, and other options in your zip code.

Nickelodeon has launched The Big Green Help, an amazingly interactive site that makes saving Earth the most fun job you'll ever have. Learn more at www.nick.com/biggreenhelp.

Stop Global Warming is a virtual “march” to bring citizens together to declare that global warming is here now and it's time to demand solutions. Over 1 million marchers have joined already—add your voice and learn how you can take action! Visit www.stopglobalwarming.org.

The Bookshelf

The Curse of Akkad: Climate Upheavals that Rocked Human History by Peter Christie (Annick Press, 2008). Each compelling story shows how climate has been “a leading actor in the drama of human history”—from the ice age to volcanoes to witchcraft to World War II. Nonfiction, 144 pages.

The Down-to-Earth Guide to Global Warming by Laurie David and Cambria Gordon (Scholastic, 2007). This book is jam-packed with information and ideas to promote youth involvement in climate change solutions. Nonfiction, 112 pages.

Generation Green: The Ultimate Teen Guide to Living an Eco-Friendly Life by Linda Sivertsen and Tosh Sivertsen (Simon Pulse, 2008). This mother-son writing duo lives “green” and shares their tips and many others in this comprehensive guide. From eating “green,” to hanging out “green,” to “green” schools and careers—there is something in this book for everyone! Nonfiction, 248 pages.

An Inconvenient Truth: The Crises of Global Warming by Al Gore (Viking, 2007). As a companion to the movie of the same name, this book speaks directly to young people with words and images explaining the growing dilemma facing our planet. Nonfiction, 192 pages.

Investigating Climate Change by Rebecca Jones (Lerner Publishing, 2008). With graphs, photographs, and simple text, this book will turn any reader into a knowledgeable advocate for combating climate change. Nonfiction, 112 pages.

A Note to Teachers, Youth Leaders, Parents, & Other Adults: How to Use This Workbook

Young people have ideas, energy, and enthusiasm that can benefit our communities once they get involved. The question may be, where to start? By giving this book to students or to your own children, you are helping them participate successfully in service learning. The process of completing the activities helps them develop personal skills, knowledge, and abilities required to address the community needs they care about. Kids can use this workbook themselves, or adults can guide them in its use in school, youth groups, or a family setting. The following sections explain in more detail how these groups can get the most out of this workbook.

Please note: While some consider the topic of climate change and global warming to be controversial, this book relies on the general consensus from the international scientific community that it is a fact.

In a School Setting

This book can easily be used in various ways within a school:

Academic Class: As part of a unit of study about the environment, whether local, national, or international, this book provides an interdisciplinary approach to examining this important issue. Students look at issues from various perspectives, analyze information, conduct research, read an interview with an expert, discuss a literature selection, develop activity plans, and put their plans into action. The series of lessons can be implemented over three to six weeks of class time when used continuously, depending on the length of the service experience. Another option is to complete one to two activities per week and extend the study over a semester.

Advisory Class: Many schools have a dedicated 30- to 40-minute weekly advisory class meant to improve academic skills, provide opportunities for social-emotional development, and allow for a successful experience in a course of study or exploration. This book allows students to develop communication and research skills, teamwork, and problem solving, while working to make a significant contribution. When implemented in a weekly advisory class, all the activities could be completed in about three months.

After-School Program: These varied activities suit an after-school program. The lessons are easily implemented and include many creative opportunities for expression that vary the teaching and learning methods. Different ages of students also can collaborate successfully. Activities include partner work as well as small and large group experiences. If implemented twice a week in an after-school program, the lessons would most likely extend over three months.

Student Council: If you are looking for a way to transform a typical student council community service project into service learning, this book can be your guide. As students are exploring the issues, they can develop a project that extends into the student body. Part of the project could be an awareness campaign with the leadership students sharing with fellow students what they consider to be the most important information in this book, augmented by what they discover through research.

In Youth Groups

As service learning grows in popularity with youth groups, program staff often looks for activities that encourage academic skills in a nontraditional manner. Use of this workbook is most effective when consistent—for example, one or two times per week—so students know what to expect and what is expected of them. The activities compiled here offer opportunities for lively discussion, firsthand community experiences, creative expression (for example, writing, poetry, drama, and art), and integrated reflection.

As a Family

Family service projects provide opportunities for common exploration and experience. Rather than emphasizing the academic elements, families can use the workbook to guide them through the terrain of the service learning process while gaining collective knowledge and stimulating ideas for projects. It's helpful for family members to approach investigating this topic on equal ground, with the youngest members being encouraged to share their thoughts and ideas.

For every participant, this book is designed to open minds, create possibilities, and encourage the lasting benefits that occur when making a contribution of one's personal talents and skills. Each person has value in the service learning process.

Cathryn Berger Kaye, M.A.

Sources for Climate Change & Global Warming Facts

Pages 11–12: Facts about people are from The Sierra Club (www.sierraclub.org, accessed March 2009).

Facts about plants are from “Greenland and the Polar Ice Cap Are Melting” by Vin Suprynowicz (*Las Vegas Review-Journal*: January 4, 2009).

Facts about animals are from “Global Warming Linked to Caribou-Calf Mortality” by Penn State (*ScienceDaily*: May 2, 2008; www.sciencedaily.com/releases/2008/05/080501180253.htm, accessed March 2009).

Facts about weather are from “Climate Change and Water” by B.C. Bates, Z.W. Kundzewicz, S. Wu, and J.P. Palutikof (Technical Paper of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva, 2008).

Facts about health are from “Recent Glacial Recession in the Rwenzori Mountains of East Africa Due to Rising Air Temperature” by R.G. Taylor, L. Mileham, C. Tindimugaya, A. Majugu, A. Muwanga, and B. Nakizela (*Geophysical Research Letters*, vol. 33, no. 20. American Geophysical Union, Washington, DC, 2006).

Facts about land and water are from “Threats: Coral Reef Bleaching” by Environmental Defense Fund (www.edf.org/article.cfm?contentID=4709, accessed March 2009).

Facts about food are from “Energy and Sustainable Agriculture” by Hunter L. Lovins and Christopher Juniper (The John Pesek Colloquium on Sustainable Agriculture, 2005).

Page 19: Select statistics in the section “Fuel for Thought” are from Save Our Seas for Teens (www.saveourseas.com/minisites/teens/be_done_internation.0.html, accessed March 2009).

Page 25: Statistics in the section “The Birth of Environmentalism” are from the following sources: Radford University's Environmental History Timeline (www.runet.edu/~wkovarik/envhist, accessed March 2009); National Women's Hall of Fame (www.greatwomen.org/women.php?action=viewone&id=50, accessed March 2009); and *I Want to Be an Environmentalist* by Stephanie Maze (Harcourt Children's Books, 2000).

Page 26: Information about the 2008 G-8 Summit is from “G-8 Summit Opens with Spotlight on Aid for Africa” by Malcom Foster (abcnews.go.com/International/wireStory?id=5319628, accessed March 2009).

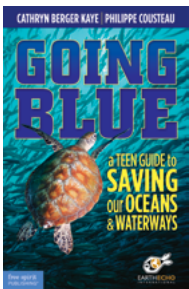
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With this hands-on workbook, you can:

- Learn about the climate changes happening around the world
- Discover how kids everywhere are helping
- Find out what your own community needs
- Plan and do meaningful service projects
- Reflect on what you've learned and accomplished
- Show and share your learning with others

Teachers, Parents, and Group Leaders: Use this workbook in a classroom or youth-serving organization, an after-school program, or as a family. It can be used on its own or as a companion to *The Complete Guide to Service Learning*.

Cathryn Berger Kaye, M.A., is a former classroom teacher, a nationally recognized expert on service learning, and an International Service Learning Consultant. She works with state departments of education, university faculty and students, school districts, and classroom teachers on issues including service learning, civic responsibility, and respectful school communities.



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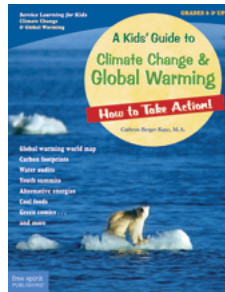
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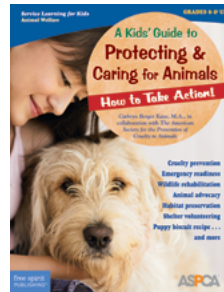
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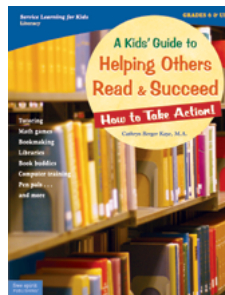
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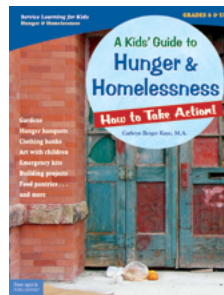
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