

NEW YORK STATE
Conservationist

SPRING 2009

for
KIDS!

CLIMATE
CHANGE



You're holding

NEW YORK STATE Conservationist

for
KIDS!

In this issue of *Conservationist for Kids* we'll learn about climate change, including how it affects you and New York State, and what you can do about it. There's a lot more to say than we can fit in these pages, so take a look at some of the books we suggest on page 3 to learn more. You'll find most of them in your local library.

Pssst...

Do you recognize me?

Be a page-number kid and share a photo of yourself and your friends enjoying the outdoors. Send us an e-mail or letter. We'll send you the details about what's required for us to print your photo or post it on our website.

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Want to receive **Conservationist for Kids** at home? **Subscribe to Conservationist magazine!** You'll get six issues of the award-winning **Conservationist** magazine each year, plus **Conservationist for Kids** in the October, February and April issues. Call 1-800-678-6399 for information about how to subscribe.



Visit
www.dec.ny.gov
There are links to lots of
information for kids interested
in the environment.

Earth's Changing Climate

Earth's climate changes naturally. It was very warm in the days of the dinosaurs and the last ice age was only 15,000 years ago. But today, our climate is changing faster than ever before in human history. Scientists believe that people are responsible.



Weather

Weather refers to the conditions of the air and atmosphere at a specific time: how warm or cold, wet or dry, clear or stormy it is.

Climate

Climate refers to long term trends in temperature and precipitation. It describes the average weather of a place over many years.

Climate Change

Climate change refers to changes in the climate over a period of 30 or more years. **Global warming** means an increase in the average temperature of the planet.

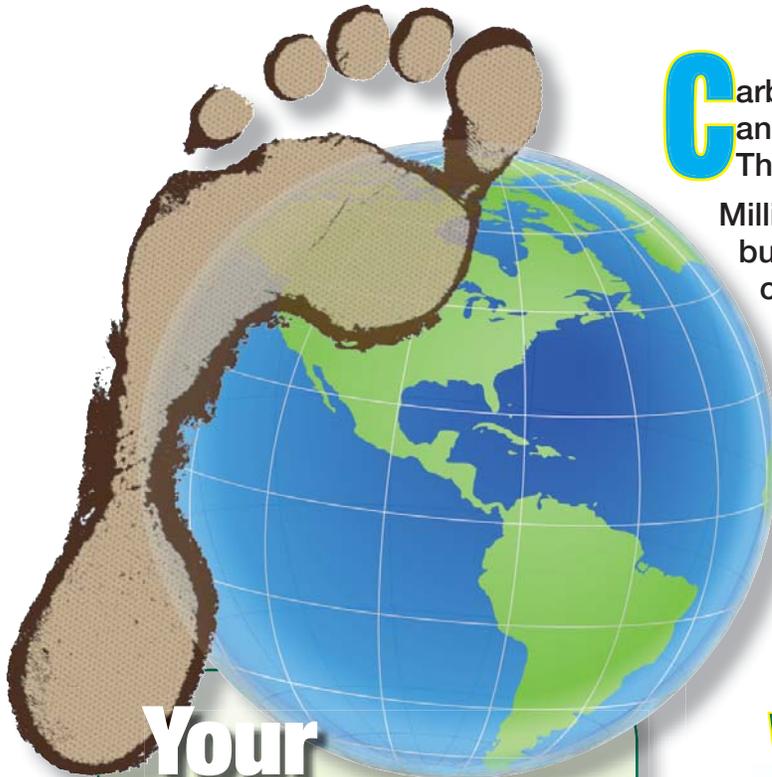


Q: What do **POLAR BEARS & NEW YORK STATE** have in common?

A: They're both affected by **CLIMATE CHANGE!**

You've heard about climate change and global warming... about the polar ice sheets melting and polar bears losing their habitat? That would be like you losing your house, and your neighborhood, and finding it harder to get food.





Carbon is in every living thing. When plants and animals die, decomposers break them down. The carbon is released as carbon dioxide.

Millions of years ago, some plants became buried. They didn't decompose, so the carbon in them was never released. After many years they turned into the coal, oil, and natural gas we know today as fossil fuels.

Every time fossil fuels are burned to provide energy to get things moving (fuel for the car), to make things work (produce electricity), or to heat our homes, the carbon in them is released.

Your Carbon Footprint

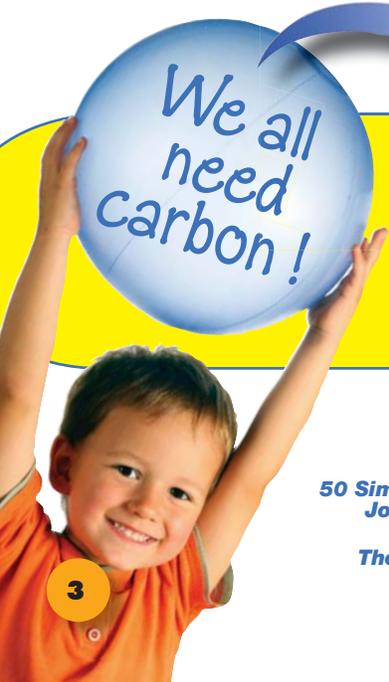
is a measure of the greenhouse gas from your daily energy use.

Reduce your energy use and shrink your carbon footprint.

What happens to carbon dioxide from burning fossil fuels?



It goes into Earth's atmosphere, where carbon dioxide naturally exists already. It can stay there for a very long time—a thousand years—before it is taken up and used by plants in photosynthesis. We're adding carbon dioxide faster than it is being used, so the amount of carbon dioxide in Earth's atmosphere is increasing. The result is a changing climate.



We all need carbon!

It's an element in every living thing.

Rocks and minerals made of fossilized animals and plants have carbon in them.
There's carbon in the foods we eat.
And there's carbon in you, too!

For more information

The Down-to-Earth Guide to Global Warming by Laurie David and Cambria Gordon (Orchard Books, Scholastic Inc., New York, 2007)

The Everything Kids' Environment Book by Sheri Amsel (Adams Media, Avon, Massachusetts, 2007)

50 Simple Things Kids Can Do to Save the Earth by The Earthworks Group (Scholastic Inc., New York, 1990)

Journey for the Planet: a Kid's Five Week Adventure to Create an Earth-friendly Life by David Gershon (Empowerment Institute, Woodstock, NY, 2007)

The Live Earth Global Warming Survival Handbook by David de Rothschild (Rodale Books, New York, 2007)

Earth's Changing Climate

It's possible that in New York State by the end of this century only the Adirondack High Peaks will have snow on the ground for more than a month in winter. In the Finger Lakes and Great Lakes, longer, hotter summers may cause more evaporation, so the water levels may drop. In the Hudson Valley, New York City and Long Island, the shoreline will change as melting polar ice sheets contribute to rising sea levels.

Changes in our climate will be more dramatic in future decades.

Energy from the sun reaches the Earth. Some of the energy is reflected back into space. Some passes through Earth's atmosphere and warms the surface of the planet. Warmth from the surface radiates back into the atmosphere where greenhouse gases trap the heat.

Incoming solar radiation warms the Earth's surface.

The GREENHOUSE EFFECT

is what keeps our planet warm enough to support life. Greenhouse gases in Earth's atmosphere, including carbon dioxide, act like an insulating blanket. They hold heat and the atmosphere warms.

Heat emitted from Earth's surface warms the atmosphere.

More greenhouse gas in the atmosphere (like carbon dioxide) means more heat energy is trapped. Heat in the atmosphere powers the Earth's weather and climate.

Scientists believe New York will have a warmer climate with:

- Longer, hotter summers
- Shorter winters with less snow cover
- Dry spells several weeks long (drought)
- Periodic extreme rains and storms
- Rising sea levels
- Changes to plant and animal populations



Some solar radiation is reflected by Earth and its atmosphere.

ATMOSPHERE



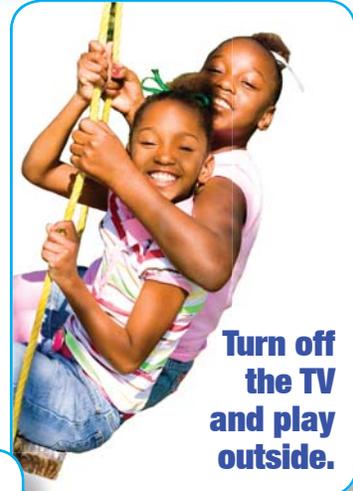
What YOU Can Do

Some of the things we can each do to help limit climate change are very simple.

What are you already doing?



Use compact fluorescent light bulbs (CFLs).



Turn off the TV and play outside.



Ride your bike or walk instead of driving for short trips.



Take a shower, rather than a bath. Keep it short and warm, not hot, to really make a difference.

Set the thermostat no higher than 68 deg.F when you're heating, and no lower than 78 deg.F when you're cooling.



Pack lunch in a cloth bag using refillable containers, rather than single-serving packages. Don't forget your cloth napkin!



If we each conserve energy and use fewer fossil fuels every day, we can limit changes to our climate. It's time to get in the habit of thinking about the energy we use and using it more wisely.

About Climate Change

A lot of little things add up to big savings for the planet.

Plant a tree. It stores carbon as it grows.



What
else
could
you
do?



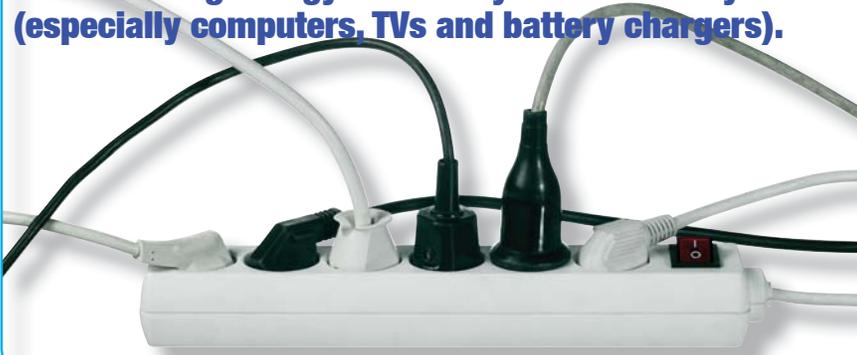
Play games that don't need batteries or electric power.

Take the bus or subway instead of the car for longer trips.



Skip the clothes dryer and hang your laundry to dry.

Use a power strip or unplug devices to stop them from drawing energy when they're in "standby" mode (especially computers, TVs and battery chargers).



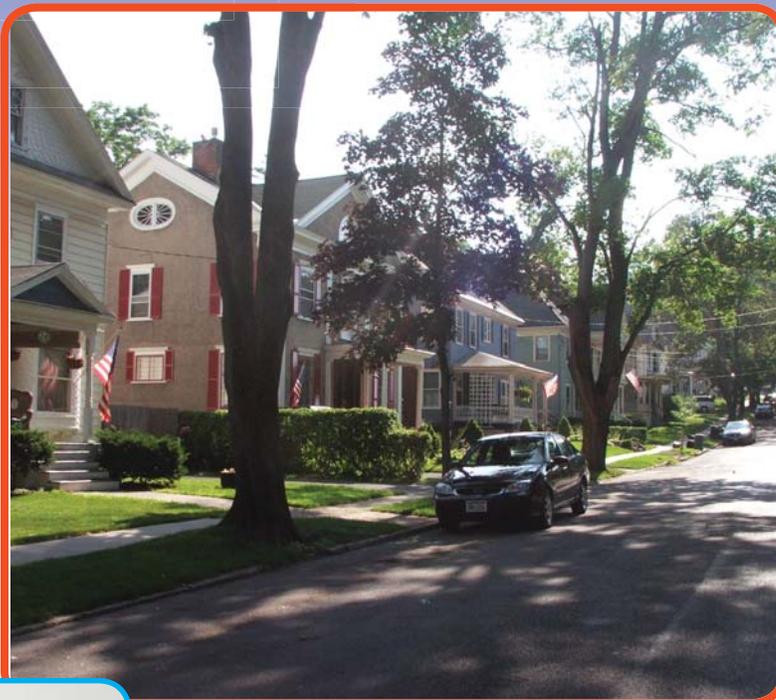
Turn lights off when you leave a room.

The **OUTSIDE** Page Ideas for Exploring Outdoors!

A World of **Carbon**

Take a friend and go for a walk outdoors. Take a deep breath. Remember the carbon dioxide in the atmosphere? It's in the air you breathe. The trees and other plants need it for photosynthesis; it helps them grow. While they are growing, they are storing carbon, locking it out of the atmosphere.

Where else is carbon stored? It's in the plants and in anything made from plants: the wood in buildings, decomposing leaves and branches on the ground, and in the soil. See page 3 for some hints.



Make Your Own **Litterless Lunch Kit**

Instead of a throwaway lunch, pack everything in containers you can clean and reuse each day. Consider what you like for lunch and choose containers to suit your needs. You'll use fewer resources and send less to the landfill, and you'll save money because you can buy food in bulk, rather than expensive single-serving packets.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

New York State *CONSERVATIONIST FOR KIDS* Volume 3, Number 2, Spring 2009

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Conservationist for Kids

Supplement for Classroom Teachers Spring 2009
"Climate Change"

Using *Conservationist for Kids* in the Classroom

Conservationist for Kids (C4K), and an accompanying teacher supplement, is distributed to public school fourth-grade classes three times each school year (fall, winter, spring). These materials are also available at www.dec.ny.gov in both HTML and PDF formats. Teachers and students may e-mail questions and suggestions to us at cforkids@gw.dec.state.ny.us. Printable activity sheets and links to other resources can be found on our website. Go to www.dec.ny.gov, and look for *Conservationist for Kids* under the "Education" heading. You will also find back issues of C4K and the activity sheets and teacher supplements associated with them.

Looking at Climate Change with your Students

Climate change can be a daunting subject to address with your students. Information for young readers ranges from simple to complex, with a lot of variation in between. Some excellent resources are available to assist teachers and parents as they investigate climate change with children and youth of all ages. A short list is provided here. A longer list is available at the C4K section of DEC's website.

This issue of C4K is a simplified look at climate change. Consider it an introduction to the basic concepts, but not a stand-alone piece. We hope it will promote discussion and questions from your students. Rather than instill fear, we want to promote curiosity to learn more and an eagerness to take action and make a difference.

MST Curriculum Connections

The activities in this issue of *Conservationist for Kids* correlate to the New York State Learning Standards for Math, Science and Technology for fourth grade, as shown below. Connections to other learning standards are also valid.

A World of Carbon: MST2. *Engineering Design 1*
 MST4. *The Living Environment 4-7*
 MST5. *Engineering Design 2, 6, 7*

Litterless Lunch Box: MST4. *The Living Environment 1-7*

Teacher Workshops

For teachers who have participated in a Project Learning Tree, Project WET or Project WILD workshop, the activities listed below complement the spring 2009 issue of C4K. For information about workshops and about how to obtain these curriculum and activity guides, visit www.dec.ny.gov/education/1913.html

Project Learning Tree: The Global Climate; Our Changing World
Project WET: Piece it Together
Project WILD: Flip the Switch for Wildlife

Supplemental Activities for the Classroom

Energy Mobile

As a class, create a mobile showing some of the ways we use energy and some ways we can save energy. Guide your students through a brainstorming session to make lists of ways they use energy and how they can save energy. (Visit www.dec.ny.gov/education/44122.html for some ideas.) After that, students may either draw pictures or cut out magazine photos to use in the mobile. Because the sun is the source of our energy, place it at the top, and build the branches of the mobile below it. If you like, balance energy use and energy savings in the same area on the same branch (e.g., driving in a car vs. riding a bicycle; using a clothes dryer vs. hanging items to dry on the line; using a reading lamp vs. relying on sunlight). Make multiple mobiles: one for savings at school, one for savings at home, and one for savings in the community.

Recommended Books (additional books are listed in *Conservationist for Kids*)

Teaching About Climate Change: Cool Schools Tackle Global Warming by Tim Grant and Gail Littlejohn (Green Teacher, Toronto, 2001)

The Greenhouse Effect: Warming the Planet by Darlene R. Stille (Compass Point Books, Minneapolis, Minnesota, 2007)

Changes in the Wind: Earth's Shifting Climate by Margery and Howard Facklam (Harcourt Brace Jovanovich, Publishers, New York, 1986)

How We Know What We Know About Our Changing Climate: Scientists and Kids Explore Global Warming by Lynn Cherry and Gary Braasch (Dawn Publications, Nevada City, CA, 2008) The teacher guide by Carol L. Malnor is a separate publication.

Web-based Resources for Teachers and Parents, some with sub-pages for kids

www.dec.ny.gov/pubs/39495.html "Climate Change and New York's Future" in *New York State Conservationist*, August 2007 pp10-13.

www.nwf.org/globalwarming/ National Wildlife Federation - see especially "Climate Classroom" under Global Warming heading

<http://hdgc.epp.cmu.edu/teachersguide/teachersguide.htm#teachersguida> - *Teachers' Guide to High Quality Educational Materials on Climate Change and Global Warming*; Provides guidance to understanding climate change materials on the web and links to other sites

www.need.org/EnergyInfobooks.php National Energy Education Development Project - Classroom ideas on energy education for all grade levels

www.GetEnergySmart.org/EnergyEducation/ NYS Energy Research and Development Authority (NYSERDA) - general information and "Energy Smart Students" curriculum workshops for educators

<http://ipcc-wg1.ucar.edu/> Intergovernmental Panel on Climate Change - "frequently asked questions"

www.epa.gov/climatechange/index.html U.S. Environmental Protection Agency - detailed information on a wide range of climate change areas of interest; link to EPA climate change site for kids

www.climatechoices.org/index.html Union of Concerned Scientists - climate change in the northeast US

www.pewclimate.org/global-warming-basics Pew Center on Global Climate Change - general information about climate change; also see "Kids page" link

www.dec.ny.gov/energy/43384.html NYS Department of Environmental Conservation (DEC) - New York State programs to combat climate change

www.dec.ny.gov/60.html NYS DEC - energy and climate

<http://eo.ucar.edu/kids/index.html> National Center for Atmospheric Research and the UCAR (University Corporation for Atmospheric Research) Office of Programs - activities for children related to weather and climate; see also www.windows.ucar.edu/earth/climate/carbon_cycle.html for carbon cycle game from UCAR

<http://cocorahs.org/> Community Collaborative Rain Snow and Hail Network - Weather monitoring citizen-science program for children, families and groups.

<http://globalwarmingkids.net/> portal for climate change sites for kids

www.energystar.gov/index.cfm?c=kids.kids_index energy and climate information and activities for teachers and students from the Energy Star Program