

An Introduction to Global Warming  
for Students in Grades 6-8

# Global Warming

This term refers to the general increase in the earth's average temperature caused by the presence of greenhouse gases in the atmosphere, which causes changes in climate patterns across the globe.

## Some of the news you may have heard

**Polar bears** are losing their habitats

**Sea level** is rising

**Hurricanes** are getting bigger and stronger

**Glaciers** are melting fast

**Temperatures** are going up

### *How do we know?*

Scientists have been able to study climate change by looking at tree cores, atmospheric composition, sediment cores, ice cores and through observation.

# Resources

Many resources are available for more information on climate change and global warming. Here are a few:

## FOR STUDENTS

### On the Web:

Environmental Protection Agency,  
[www.epa.gov/climatechange/kids/](http://www.epa.gov/climatechange/kids/)

National Oceanic and Atmospheric Administration (NOAA)

For grades 6 - 12

[www.ncdc.noaa.gov/oa/climate/globalwarming.html](http://www.ncdc.noaa.gov/oa/climate/globalwarming.html)

[www.education.noaa.gov/students.html](http://www.education.noaa.gov/students.html)

OneClimate.net offers links to other climate change sites

[tiki.oneworld.net/global\\_warming/climate\\_home.html](http://tiki.oneworld.net/global_warming/climate_home.html)

Nature Conservancy

[www.nature.org/initiatives/climatechange](http://www.nature.org/initiatives/climatechange)

National Wildlife Federation's Climate Classroom

[www.climateclassroom.org/teens](http://www.climateclassroom.org/teens)

Stop Global Warming

[www.stopglobalwarming.org/classroom](http://www.stopglobalwarming.org/classroom)

### Books:

*Dr Art's Guide to Planet Earth*,  
Art Sussman, Ph.D.

*An Inconvenient Truth: The Crisis of Global Warming*. Adapted for a New Generation,  
Al Gore

*A Down-to-Earth Guide to Global Warming*, Laurie David and Cambria Gordon

*How Do We Know What We Know About Our Changing Climate: Scientists and Kids Explore Global Warming*, Lynne Cherry

*Fight Global Warming Now: The Handbook for Taking Action in Your Community*, Bill McKibben

*50 Simple Things Kids Can Do to Save the Earth*, Andrews McMeel Publishing

*The Solution is You! An Activists Guide*, Laurie David

*We Are the Weather Makers*, Tim Flannery, Adapted by Sally M. Walker

*The North Pole Was Here*, Andrew C. Revkin

## FOR TEACHERS AND PARENTS

Union of Concerned Scientists  
[www.climatechoices.org](http://www.climatechoices.org)

Nature Conservancy  
[www.nature.org/initiatives/climatechange/calculator](http://www.nature.org/initiatives/climatechange/calculator)

Nature Conservancy's Supporting Environmental Educators  
[www.nature.org/leaf/about/educators.html](http://www.nature.org/leaf/about/educators.html)

### For curriculum:

EE Week

[http://www.eeweek.org/climate\\_change](http://www.eeweek.org/climate_change)

Time for Kids

[www.timeforkids.com/TFK/Teachers/minilessons](http://www.timeforkids.com/TFK/Teachers/minilessons)

Center for Environmental Education  
[www.ceeonline.org/](http://www.ceeonline.org/)

National Wildlife Federation  
[online.nwf.org/site/PageNavigator/ClimateClassroom/cc\\_homepage](http://online.nwf.org/site/PageNavigator/ClimateClassroom/cc_homepage)

Earth Day Network  
[www.earthday.net](http://www.earthday.net)

Global Warming Education  
[climatechangeeducation.org](http://climatechangeeducation.org)

Zero Footprint Kids Calculator For Teachers  
[www.zerofootprintkids.com](http://www.zerofootprintkids.com)

Creative Change Educational Solutions  
[www.creativechange.net](http://www.creativechange.net)

*Teaching about Climate Change: Cool Schools Tackle Global Warming*, edited by Tim Grant and Gail Littlejohn

*Low Carbon Diet, A 30 Day Program to Lose 5000 Pounds*, David Gershon

# Key Concepts

**climate change**—a term used to describe trends in the earth’s climate. For example, scientists see that the planet’s average temperature is rising. This affects wind and ocean currents as well as yearly amounts of rain and snow. Climate change affects different parts of the world in different ways. Take a look at what is happening in the Arctic as compared to the Hudson Valley.

**global warming**—refers to the general increase in the earth’s average temperature, which causes changes in climate patterns across the globe. The earth’s average temperature has been increasing over the last century. For example, there is some evidence that suggests that the U.S. Northeast will get colder as the poles melt and cold, fresh water changes currents near the East Coast.

**greenhouse gases**—are carbon dioxide and methane, mostly caused by human activity. Greenhouse gases are in the atmosphere, absorbing and holding heat, which causes earth’s temperature to rise.

**Keywords to explore and know:** acidification, alternative energy, atmosphere, biomass, carbon cycle, carbon dioxide, carbon footprint, conservation, deforestation, ecosystems, energy, estuary, food web, fossil fuels, fuel efficiency, greenhouse effect, habitat, Industrial Revolution, invasive and native species, natural resources, ozone, photosynthesis, pollution, renewable and solar energy, species migration, symbiosis, watershed.

Look up key events in American environmental history—for example, Earth Day, an environmental movement that was founded in 1970 when 20 million Americans protested for a healthy and sustainable environment. Earth Day represents the hope for a clean planet. Other examples are the Clean Air Act, Clean Water Act, Endangered Species Act, Kyoto Protocol and the SCENIC HUDSON DECISION.

# Carbon Footprint



Since the Industrial Revolution (from about 1850 to the present) astounding amounts of greenhouse gases have been introduced into the earth's atmosphere. This is primarily due to increased use of fossil fuels for generating power.

Americans are huge consumers of products that use enormous amounts of energy and generate large amounts of waste.



A carbon footprint is the amount of carbon dioxide a person, family or business emits through the use of fossil fuels.



Your carbon footprint is the impact your lifestyle choices have on the earth. Two of the biggest contributors are your driving and travel habits as well as your electricity use at home. Other impacts come from your diet and the products you buy.



## Have you stopped to consider your personal contribution to climate change?

You send greenhouse gases into the atmosphere when you...

- watch TV
- play video games
- turn on a light
- ride in a car
- put trash in a landfill
- use electricity to listen to music



# Impacts on the Hudson Valley

As temperatures increase around the world, weather patterns and seasons will change here in the valley. These changes in climate already are having troubling effects:

- higher temperatures
- more intense rain and floods
- less snow
- increased droughts
- increased cost of food
- poor air quality
- changes in forests and wetlands
- sea-level rises (remember, the Hudson River is connected to the Atlantic Ocean)

## Does this affect you?

Use the resources provided in this booklet to further investigate.



Josh Clague (map & Black Creek photo)

**Hudson River Watershed Map**

\*Information from the Hudson River Estuary Program at: [www.dec.ny.gov/](http://www.dec.ny.gov/) and the Union of Concerned Scientists: [www.climatechoices.org](http://www.climatechoices.org).



OUR PLANET NEEDS  
YOUR HELP

OUR HUDSON VALLEY  
NEEDS YOUR HELP

Our planet is a complex ecosystem with dynamic interactions,  
but we all breathe the same air and drink the same water.

The issue of climate change impacts your life no matter  
where you are—and it's up to all of us to be  
part of the solution.

Everyone on earth  
is affected.



# How will you challenge yourself to lower your impact?

To calculate your carbon footprint:

## **Zero Footprint Kids Calculator**

[www.zerofootprintkids.com/kids\\_home.aspx](http://www.zerofootprintkids.com/kids_home.aspx)

## **Ecological Footprint by Center for Sustainable Economy**

[www.myfootprint.org](http://www.myfootprint.org)

## **U.S. EPA's "Calculate Your Impact"**

[www.epa.gov/climatechange/kids/calc/index.html](http://www.epa.gov/climatechange/kids/calc/index.html)

To test your green knowledge:

## **Smithsonian National Zoological Park's**

[nationalzoo.si.edu/publications/greenteam/greenquiz.cfm](http://nationalzoo.si.edu/publications/greenteam/greenquiz.cfm)

To play American Public Radio's interactive Consumer Consequences game:

[sustainability.publicradio.org/consumerconsequences/](http://sustainability.publicradio.org/consumerconsequences/)



For information about energy facts and efficiency, go to the website for students at the Energy Information Administration:

[www.eia.doe.gov/kids/](http://www.eia.doe.gov/kids/)

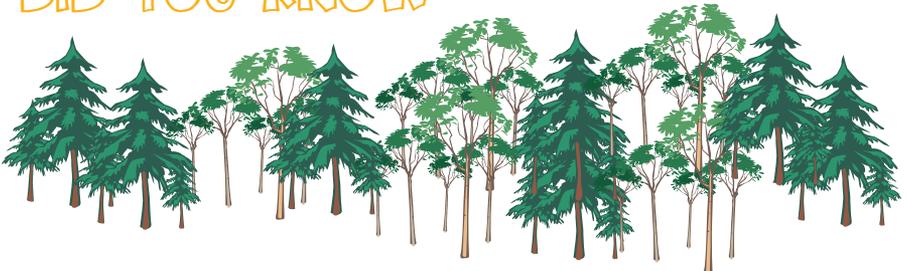
One of Scenic Hudson's contributions is lowering the carbon footprint by...

## **Preserving FORESTS!**

Trees, through photosynthesis, absorb and store carbon dioxide.

They act as natural air filters. Trees help to control erosion and flooding.

## DID YOU KNOW



**1 tree consumes 1 ton of carbon dioxide during its lifetime!**

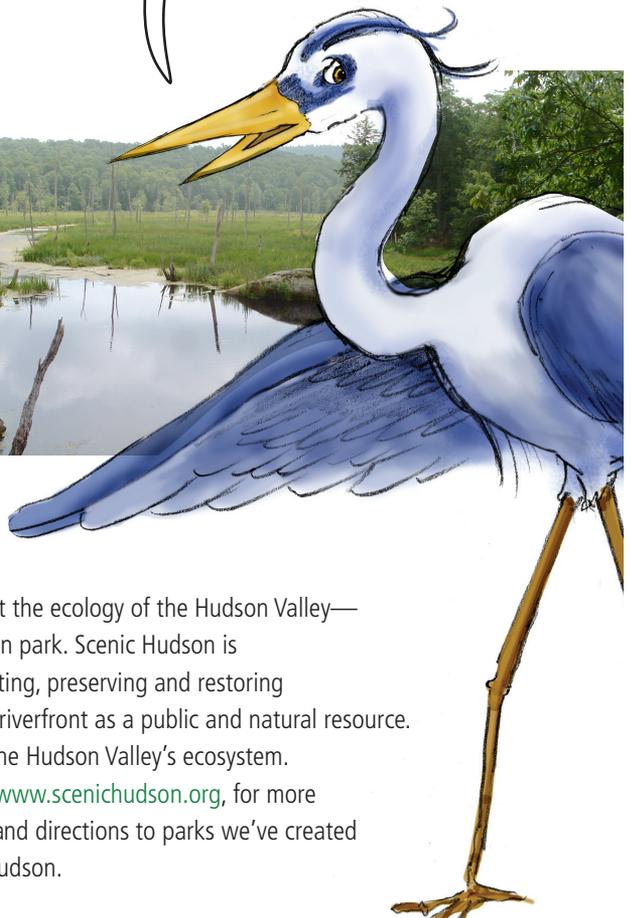
## Focus on Plant and Animal Impacts



As climate changes in the Hudson Valley, species in our own backyard will be affected. Impacts might be: loss of habitat, loss of native plants, changes in pollination, changes in migration patterns, shifts in food availability for humans and wildlife, possible extinction.

### THINK ABOUT THIS

How is the habitat of the polar bear being affected by climate change? What species in the Hudson Valley will be affected by climate change?



To learn more about the ecology of the Hudson Valley—visit a Scenic Hudson park. Scenic Hudson is dedicated to protecting, preserving and restoring the Hudson and its riverfront as a public and natural resource. Learn more about the Hudson Valley's ecosystem. Go to our website, [www.scenichudson.org](http://www.scenichudson.org), for more information, maps and directions to parks we've created up and down the Hudson.

# YOU Can Make a Difference!

## Be a part of the solution!

### What you can do:

- Reduce, reuse, recycle!
- Bike or walk instead of driving
- Carpool to school
- Conserve water
- Get educated about taking care of the environment
- Use both sides of paper
- Organize a class project to teach others about climate change solutions
- Be energy efficient...turn off lights, unplug electronics, use a power strip, unplug chargers (cell phone, iPods, etc.) when not in use
- Bring lunch in reusable containers
- Use reusable bottles for water (save money, reduce pollution)

### What your family can do:

- Reduce, reuse, recycle!
- Buy a hybrid car
- Look for green energy alternatives
- Use compact fluorescent light bulbs
- Go solar
- Walk instead of drive
- Buy local
- Shop at the farmers' market
- Use less hot water
- Use products made from recycled paper
- Bring a reusable cloth bag to the store
- Plant a tree
- Cut down on products with excess packaging
- Hang laundry out to dry
- Compost
- Buy less stuff



*Small lifestyle changes add up!*

# “Every little thing counts!”

—Mia, sixth-grader

TRACKING YOUR PROGRESS: What are you doing now? What will you change to make a difference in the world?

**Be part of the solution.**

Already doing  
Will do now  
Are you crazy?

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## Get involved

- Volunteer in your community
- Write your elected officials—tell them your hopes for a healthy environment
- Start a school project to educate others
- Plant trees

## Reduce

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- Take canvas bags to the grocery store
- Bring your lunch and drinks in reusable containers
- Cut down on the amount of trash you produce

## Save energy

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- Turn off lights, TVs, computers and radios when not in use; unplug your stuff!
- Turn down the heat or air conditioning
- Walk or ride your bike whenever possible

## Conserve water

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Turn off the faucet when brushing your teeth
- Take shorter showers

## Recycle

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- Recycle paper, metal, glass and plastic
- Use recycled products
- Use rechargeable batteries

# YOUR CHOICES MATTER

The choices we make will  
determine the extent of climate change.

## Who's Scenic Hudson?

We are a group of dedicated people who care about the area we live in—the Hudson River Valley. Over 40 years ago, our founders fought to protect a mountain from being made into a power plant. Since then, we have continued to work together with towns like yours to protect special places and make them enjoyable for you to visit.



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