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## New Feature! Tell Us How Your Students Are Helping the Air!

We want to hear from you! Send us some of the good things your students are doing to promote healthy air quality or to help keep the air clean. Include a brief description of your project or actions, why you chose to do it, the name and location of your school, the teacher's name, and the grade of the class. We'll highlight some of the great stories in the next issue of *The School Breeze*, and with enough participation, we'll continue this feature in every issue! Send your information to [alexis.santel@hamilton-co.org](mailto:alexis.santel@hamilton-co.org).

## Anti-Idling Campaign Well Under-Way



Environmental Services (HCDOES) – Air Quality Management Division (AQMD). In conjunction with a grant from the USEPA to retrofit school buses with particulate trapping oxidation catalysts, the AQMD has been educating bus drivers and parents in the Cincinnati area to reduce their idling time in order to lessen schoolchildren's exposure to harmful diesel exhaust emissions.

We are pleased to report that our efforts have thus far been successful! Drivers within the Riggs Bus Company are learning to turn their buses off, especially when waiting for children after school. The AQMD has instituted a "prize patrol" that makes weekly visits to Riggs serviced schools and awards drivers who are not idling. So far, all drivers have been complying with the anti-idling policies. Along with the drivers, their riders are also awarded, and teachers and parents at the schools are given educational information as well.

The AQMD will be expanding the anti-idling campaign beyond the schools serviced by Riggs gradually over the next school year. Until then, you can be active in your own school by reminding your bus drivers and students' parents to "Turn the Key, Be Idle Free." For more information and ideas on starting anti-idling efforts at your school, visit [www.hcdoes.org](http://www.hcdoes.org).

At the start of the 2004-05 school year, we told you about an anti-idling campaign designed by the Hamilton County Department of

## Schools With Buses Participating in Anti-Idling Campaign

A. B. Miree Fundamental Academy  
Academy of World Languages Elementary  
Cardinal Pacelli Elementary  
Clifton Elementary  
Corryville Catholic Elementary  
Douglas/Windsor Elementary  
Guardian Angels Elementary  
Hyde Park Elementary  
John P. Parker Elementary  
Kilgour Elementary  
Linwood Elementary  
Mt. Washington Elementary  
North Avondale Montessori Elementary  
Prince of Peace Elementary  
Phoenix Community Learning Center  
Sands Montessori Elementary  
Schiel Primary School for Arts Enrichment  
Silverton Paideia Elementary  
St. Mary Elementary  
St. Ursula Villa Elementary  
Woodford Paideia Elementary

## Calendar Contest

The "Do Your Share For Cleaner Air" calendar contest, sponsored by the Regional Ozone Coalition, provides an outlet for student artwork in grades K-12. One winner from each grade will be represented in this calendar focusing on how you can "do your share for cleaner air."

Entries can feature the "Do Your Share..." slogan, one of the many tips for reducing smog, or illustrate why clean air is important to our health. To receive a copy of the 2005 calendar and/or contest guidelines for the 2006 calendar, please contact Summer Jones at (513) 621-6300 or visit our website at [www.hcdoes.org](http://www.hcdoes.org).

## Air Facts

The average North American car pumps its own weight in carbon emissions into the atmosphere each year.

SUVs emit approximately 43% more global-warming pollutants and 47% more overall air pollution than the average car.

Every time a gallon of gasoline is burned, over 20 pounds of carbon dioxide is produced. On average, it takes 12 trees to absorb and lock away those 20 pounds of carbon dioxide.

One acre of forest absorbs six tons of carbon dioxide and puts out four tons of oxygen. This is enough to meet the annual needs of 18 people.



## Free Tree Seedlings for Cleaner Air

Once again, free tree seedlings are available for planting on school grounds or for use in other community planting projects. All teachers in Butler, Clermont, Hamilton, and

Warren counties are eligible to receive up to 25 free seedlings. Groups such as Boy Scouts, Brownies, and similar organizations are eligible as well.

Tree varieties available include Canadian Hemlock, Magenta Crabapple, Butterfly Bush, and Bristlecone Pine. Distribution is on a first-registered, first-served basis, and registration deadline is April 7, 2005. You will receive a

letter of confirmation for your participation.

All seedlings must be picked up between 9:00 a.m. and 6:00 p.m. at the Gardens at Village Green in Cincinnati on Thursday, April 21, 2005. The confirmation letter must be presented to claim your seedlings on the day of the event.

The Air Quality Management Division, Solid Waste Management District, and the Soil and Water Conservation District of Hamilton County are all partnering with the Gardens at Village Green to provide free tree seedlings for this project. Please visit [www.hcdoes.org](http://www.hcdoes.org) for more information and a registration form, or call (513) 946-7737.

## New Free Air Quality Notification Service Now Available

The Cincinnati area, including Butler, Clermont, Hamilton, and Warren counties, has been chosen from cities across the county to participate in the launch of EnviroFlash, a new air quality notification service. EnviroFlash is a free service that provides you with information about air quality in the location of your choice via a daily email. It is produced through a partnership between EPA and state and local environmental agencies.

In this initial pilot program, you can choose to receive notifications about air quality action days, as well as, air quality forecasts for the upcoming days. "Air quality action day" is a generic term for specific local air quality action programs such as "smog alerts."

Consider signing up for EnviroFlash to keep track of daily air quality for the health of your students. Generally, when the Air Quality Index (AQI) reaches a level above 100, it is considered unhealthy for sensitive groups such as young children and the elderly. By using this free tool, you can be notified of days when your students should remain indoors instead of having outdoor recess or physical education.

For more information on the AQI and to subscribe to EnviroFlash, visit [www.hcdoes.org](http://www.hcdoes.org).



## Need More Information?

If you would like to receive *The School Breeze* by email, please email [alexis.santel@hamilton-co.org](mailto:alexis.santel@hamilton-co.org), with the subject box stating "add to The School Breeze list." For free outreach or resources, contact Alexis Santel or visit our website: [www.hcdoes.org](http://www.hcdoes.org).

# Global Warming and the Greenhouse Effect

Some scientists believe that the global temperature of the earth has been rising slightly. One theory for this rise in average temperature says it is due to the buildup of carbon dioxide and other “greenhouse” gases in the atmosphere.

## How the Greenhouse Effect Works

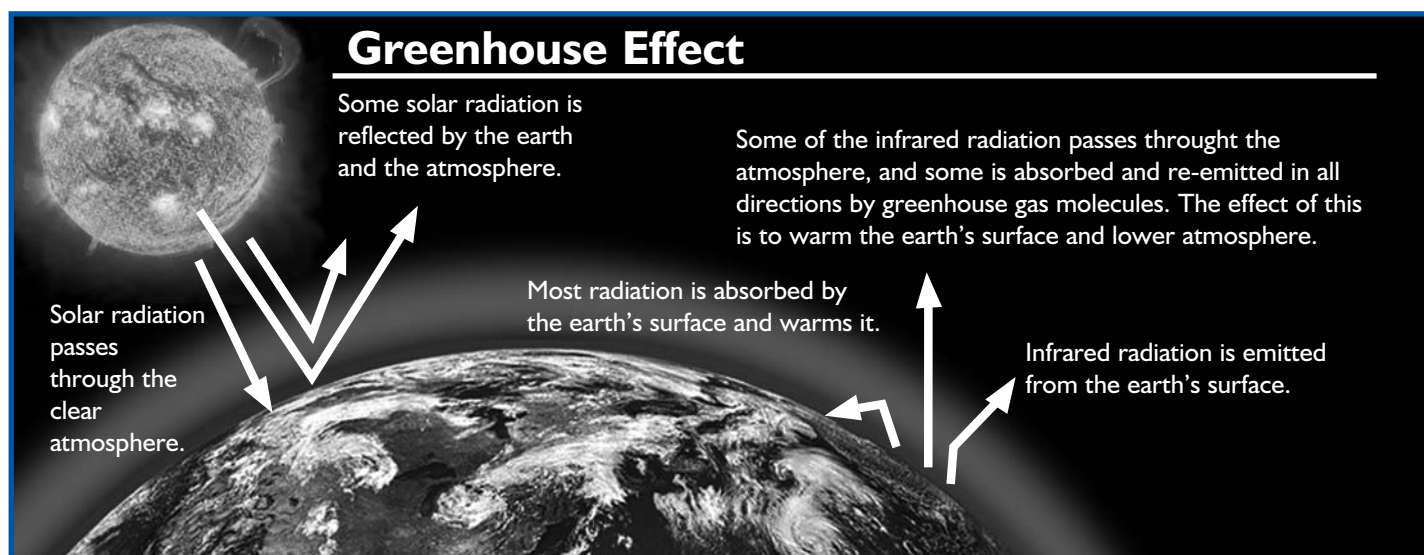
When the sun sends light energy toward the earth, some of the light rays are reflected back out into space. But, much of that energy passes through the atmosphere and is absorbed by soil, water, and rocks of the earth. That absorbed energy is then re-radiated back into the atmosphere as heat. However, because some components of the atmosphere are not transparent to heat waves, the heat becomes trapped within the atmosphere to keep the earth’s surface and lower layer of air warm. Greenhouse gases such as carbon dioxide, methane, nitrous oxides, and others contribute to the trapping of the heat within the atmosphere.

## Global Warming

Without the warmth provided by the naturally occurring greenhouse effect, the earth would become ice-covered and unlivable. However, scientists worry that if man-made greenhouse gases continue to build up in the atmosphere, they will begin to trap more and more heat at the earth’s surface, causing the overall global temperature to rise. Whenever we pollute the air by burning fuel in vehicles, power plants, or otherwise, we are adding to the concentration of the most prevalent greenhouse gas, carbon dioxide, in the atmosphere.

## What happens next?

As the temperature of the earth’s surface rises, many changes in climate could occur and life on earth could face some serious threats. Some scientists predict that precipitation will decline in certain areas, leading to crop failures and expanding deserts. In other areas, precipitation could increase, causing flooding and erosion. Plants and animals may become extinct if they cannot adapt or move to more compatible climates. The temperature increase could also cause polar ice melting, which would cause sea levels to rise and flood some coastal areas.



## Lesson Plan Grades 6-8

This experiment will demonstrate to students the effect of increased levels of carbon dioxide can have in the atmosphere.

### Materials

- 2 plastic 2-liter pop bottles
- ruler
- two thermometers (meat thermometers will work)
- 1 150-watt spotlight with a stand
- 2 full liter-sized bottles of cola or other dark colored carbonated beverage

### Procedure

1. Open one of the soft drinks the day before the experiment and leave it open overnight or until the carbon dioxide has dissipated and the cola has gone “flat.” Do not open the second bottle until just before the experiment begins. Both colas should be at room temperature.
2. Cut off the tops of the empty two-liter bottles to make two open-mouthed bottles about 8 inches in height.
3. With a ruler, mark a fill line on the side of each bottle about 3.5 inches up from the bottom. Punch a small hole in the side of each bottle at least 2 inches above the fill line.
4. Fill one bottle to the line with the flat cola. Fill the other with the fresh, fizzy cola. DO NOT insert the thermometers until a few minutes before the experiment begins (see step 6).
5. Let the containers stand for 30 to 60 minutes. This allows time for the carbon dioxide to leave the liquid and slowly fill the air space in the bottle. (Carbon dioxide is heavier than air, so it will stay in the container.) Students can test whether there is sufficient carbon dioxide by lowering a match into the bottle. If it goes out, there is enough.
6. Put the thermometers through the holes in the bottles so their ends are in the middle of the air space above the liquid.
7. Place the bottles at equal distances from the spotlight, approximately 10 inches, and record the temperature in each bottle.
8. Turn on the light. Observe and record the temperature in each bottle every minute for 10 minutes. (Exceeding 10 minutes will allow the carbon dioxide to dissipate.)

### Expected Results & Reasons

Once the experiment begins and the carbon dioxide warms up, the gas will become lighter and leave the container. However, before this happens, students should notice a temperature increase of as much as 90F in the carbon dioxide-rich container. When carbon dioxide concentrations are higher, the air will heat up more quickly. Since there is no carbon dioxide in the container with the flat cola, the air temperature will not increase as quickly. This is similar to the greenhouse effect where more carbon dioxide in the atmosphere causes the temperature of the earth to be warmer.

### Discussion

Ask students how the bottle with the fizzy cola is like the Earth’s atmosphere. What are some things we can do to reduce the amount of carbon dioxide and other greenhouse gases from being dispersed into the atmosphere?

## Free Stuff

### For Students

K-2 Friends for Clean Air Coloring Book

3-6 Clean Air Kids Activity Book – includes 16 pages of fun games, activities, and experiments.

3-6 Kids Cloud Express Activity Sheet

### For Teachers

All About Air a comprehensive Book about air quality

The Breeze a quarterly Newsletter for businesses and the community

Clean School Bus USA USPEA Booklets

2005 Do Your Share for Cleaner Air Calendar

Please visit [www.hcdoes.org](http://www.hcdoes.org) for more information and to order materials.

## Classroom Programs

HCDOES will be happy to schedule free air quality classroom programs for your students. Topics include air pollution, health, plants, global warming, alternatively fueled vehicles, and much more! A full list and brief descriptions are available at [www.hcdoes.org](http://www.hcdoes.org).

## Web Stuff

### South Carolina Bureau of Air Quality

This site has information and lessons for teachers as well as activities and facts for students. <http://www.scdhec.gov>, click on the “Outreach and Education” link.

### Texas Natural Resource Conservation Commission

This is a very popular air quality education website, with lessons and activities for all ages. If you have not visited it yet, it is a great tool for teaching air quality! [http://www.tnrcc.state.tx.us/air/monops/lessons/lesson\\_plans.html](http://www.tnrcc.state.tx.us/air/monops/lessons/lesson_plans.html)

### Earth Day is coming!

Visit this EPA site for a downloadable coloring book with tips to make the Earth a better place! <http://www.epa.gov/region5/publications/happy/happy.htm>

### Louisiana Department of Environmental Quality’s Smoginator’s Air Base

Visit this site for fun, facts, and education about smog and what you can do to help with the problem. This is a great site for kids to learn about smog and harmful ozone. <http://www.deq.state.la.us/assistance/educate/smog.htm>